Vol. I

TRANSCRIPT OF RECORD

Supreme Court of the United States

OCTOBER TERM, 1934

No. 102

SAMUEL B. SMITH, PETITIONER,

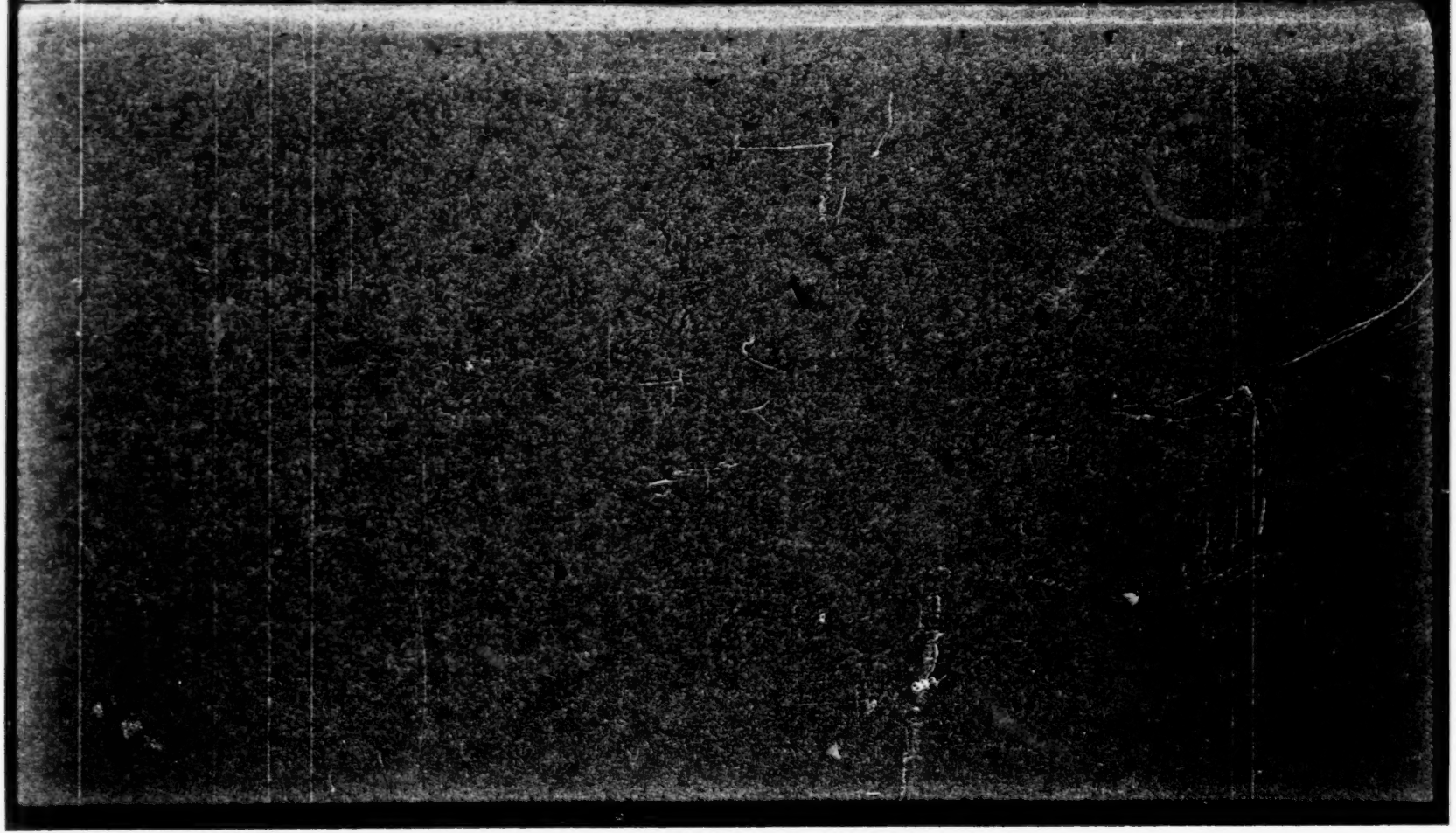
vs.

E. H. SNOW AND E. H. SNOW, DOING BUSINESS AS SNOW'S HATCHERIES AND SNOW'S INCUBATOR COMPANY.

ON WRIT OF CERTIORARI TO THE UNITED STATES CIRCUIT COURT OF APPEALS FOR THE EIGHTH CIRCUIT.

PETITION FOR CERTIORARI FILED JUNE 11, 1934.

CERTIORARI GRANTED OCTOBER 8, 1934.



United States Circuit Court of Appeals

EIGHTH CIRCUIT.

No. 9757

IN EQUITY.

E. H. SNOW, AND E. H. SNOW DOING BUSINESS AS SNOW'S HATCHERIES AND SNOW'S INCUBATOR COMPANY, APPELLANTS,

vs.

SAMUEL B. SMITH, APPELLEE.

APPEAL FROM THE DISTRICT COURT OF THE UNITED STATES FOR THE DISTRICT OF MINNESOTA.

FILED MAY 29, 1933.

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Pleas and proceedings in the United States Circuit Court of Appeals for the Eighth Circuit, at the March Term, 1934, of said Court, before the Honorable Kimbrough Stone and the Honorable John B. Sanborn, Circuit Judges, and the Honorable A. Lee Wyman, District Judge.

Attest:

E. E. KOCH,
Clerk of the United States Circuit Court of Appeals for the Eighth Circuit.

(Seal)

Be it Remembered that heretofore, to-wit: on the twenty-ninth day of May, A. D. 1933, a transcript of record pursuant to an appeal allowed by the District Court of the United States for the District of Minnesota, was filed in the office of the Clerk of the United States Circuit Court of Appeals for the Eighth Circuit, in a certain cause wherein E. H. Snow, and E. H. Snow doing business as Snow's Hatcheries and Snow's Incubator Company, were Appellants, and Samuel B. Smith was Appellee, which said transcript as prepared and printed under the rules of the United States Circuit Court of Appeals for the Eighth Circuit, under the supervision of its Clerk, is in the words and figures following, to-wit:

1

Bill of Complaint.

In the United States District Court of Minnesota, Second Division.

Samuel B. Smith, Plaintiff,
No. 2119. vs. In Equity.
E. H. Snow and E. H. Snow, d. b. a. Snow's Hatcheries and Snow's Incubator Company, Defendants.

To The Honorable the Judges of the United States District Court of Minnesota, Second Division:

Plaintiff represents and states as follows:

1. That the plaintiff, Samuel B. Smith, is a citizen of the United States and a resident of Cleveland, Ohio.

2. Upon information and belief that the defendant, E. H. Snow, resides at Sleepy Eye, Brown County, Minnesota, and that E. H. Snow, doing business as Snow's Hatcheries and Snow's Incubator Company, is located at Sleepy Eye, Brown County, Minnesota, where the said defendants are engaged and doing business in the commercial hatching of eggs.

3. The jurisdiction of this Court depends upon the fact that this suit is one arising under the patent laws of the United States.

4. Upon information and belief that prior to October 26, 1916, the plaintiff, Samuel B. Smith, was the first, original and sole inventor of certain new and useful improvements in Incubators, not known or used by others before his invention or discovery thereof, not patented or described in any printed publication in this or any foreign country prior to his invention thereof or more than two years prior to October 26, 1916, not in public use or on sale in this country for more than two years prior to said date, not abandoned, and not patented by Samuel B. Smith or his legal representatives or assigns upon an application filed more than twelve months prior to said date.

2

5. On October 26, 1916, the plaintiff, Samuel B. Smith, filed in the United States Patent Office an application for Letters Patent of the United States for said improvement.

6. That prior to April 16, 1918, Samuel B. Smith assigned the right, title and interest in and to the said invention and in and to any United States patent to issue thereon to The Buckeye Incubator Company, a corporation of Ohio, and that after due proceedings upon the said application for patent there was issued to The Buckeye Incubator Company, aforesaid, United States Letters Patent No. 1,262,860 on April 16, 1918, whereby the exclusive right of making, using and selling the said invention and improvements throughout the United States for the term of said patent was granted to The Buckeye Incubator Company, aforesaid, its successors or assigns, as will more fully appear from the original or duly certified copies of the said patent and assignment to be produced in Court herein.

7. That under date of April 29, 1927, The Buckeye Incubator Company, aforesaid, being then the owner of the title in and to the aforesaid Letters Patent, did sell, assign and transfer to the plaintiff, Samuel B. Smith, his heirs
3 and assigns, the right, title and interest in and to the said Letters Patent as will more fully appear from the original assignment or duly certified copy thereof to be produced in Court herein.

8. That the plaintiff and his predecessor in title, The Buckeye Incubator Company, have been at all times the sole and exclusive owners of the said patent.

9. That the said patented invention has proven to be of very great value, that the plaintiff has expended large sums of money in the manufacture and sale of incubators embodying the invention thereof, that the incubators so manufactured and sold have acquired a high reputation and utility and have proven to possess superior functions and qualities over other incubators, that the said patent has been widely recognized and respected, and that the validity of said patent has been established in litigations arising thereunder in various Circuit Courts of Appeal and District Courts of the United States.

10. That incubators manufactured and sold by the plaintiff have been marked "Patented" together with the date and number of the patent aforesaid as required by the Statutes of the United States, and that in addition the defendants herein have been duly notified in writing of the patent aforesaid and of their infringement thereof.

11. Upon information and belief that the defendants prior to and not more than six years before the filing of the Bill of Complaint herein, have manufactured, sold and offered for sale to others and are using in the hatching of eggs at their place of business at Sleepy Eye, Minnesota, and other locations in Minnesota, incubators embodying and operating in accordance with the invention of said, patent No. 1,262,860 and are threatening to continue the manufacture, sale and use of such incubators, thereby infringing the rights of
4 the plaintiff as secured by the said patent, all without the license or consent of the plaintiff.

12. That by reason of the infringement complained of herein, the plaintiff has suffered and is suffering irreparable loss and damage and the defendants have realized profits and gains which of right belong to the plaintiff, and will continue to do so unless restrained by this Court.

Wherefore the plaintiff prays:

1. That a writ of subpoena may issue out of this Court directed to the defendants, E. H. Snow and E. H. Snow doing business as Snow's Hatcheries and Snow's Incubator Company, commanding them to appear and answer all and singular the matters and things herein complained of,, but not under oath, an answer under oath being expressly waived.

2. That temporary and permanent injunction be issued out of this Court addressed to the defendants, E. H. Snow and E. H. Snow doing business as Snow's Hatcheries and Snow's Incubator Company, and their workmen, employees, solicitors, agents, attorneys and others claiming or holding under the defendants, enjoining and restraining them from in any manner directly or indirectly infringing upon the patent sued upon herein.

3. That the defendants be required to account for and pay to the plaintiff all the gains and profits acquired by them and recompense the plaintiff for the damages sustained by the plaintiff by reason of the infringement complained of herein.

4. That the defendants pay the costs of this suit, and that such other further and equitable relief be granted to the plaintiff as shall be found necessary or proper.

SAMUEL B. SMITH,
By Paul, Paul & Moore,
His Solicitors.

A. C. Paul,
Maurice Moore,
A. L. Ely,
Of Counsel.

5 Verification.

State of Ohio,
County of Cuyahoga—ss.

Samuel B. Smith, being duly sworn, deposes and says that he is the plaintiff named in the foregoing Bill of Complaint, that he is the owner of the title in and to the said United States Letters Patent No. 1,262,860, that the contents of the said Bill of Complaint are true of his own knowledge, except as to such matters alleged upon information and belief and as to such matters he believes the same to be true, and that he believes himself to be the original and sole inventor of the improvements in incubators disclosed and covered in the said patent.

SAMUEL B. SMITH.

Subscribed and Sworn to Before Me This 3rd Day of July, 1931.

(Seal) H. B. PERKINS,
Notary Public, Cuyahoga County, Ohio.

My Commission Expires March 17th, 1934.

(Endorsed): Filed Sep. 11, 1931. Joel M. Dickey, Clerk, By Chell M. Smith, Deputy.

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6 Bill of Particulars.

Now Comes Plaintiff and states that it will rely, at the trial of this cause, to support its allegation of infringement, upon claims 1 and 2 of the Samuel B. Smith patent, No. 1,262,860 of April 16, 1918, in suit.

MAURICE M. MOORE,
PAUL, PAUL & MOORE,
Solicitors for Plaintiff.

Minneapolis, Minnesota,
October 6, 1931.

Service of the above Bill of Particulars with copy is hereby acknowledged this 6th day of October, 1931.

WILLIAMSON & WILLIAMSON,
Solicitors for Defendant.

(Endorsed): Filed Oct. 7, 1931, Joel M. Dickey, Clerk, By Thomas H. Howard, Deputy.

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7 Defendants' Answer as Amended.

E. H. Snow, doing business under the names, "Snow's Hatcheries" and "Snow's Incubator Company", defendant, in answer to the plaintiff's Bill of Complaint and Bill of Particulars, hitherto filed in the above entitled suit, avers as follows:—

I.

The defendant admits the allegations made in paragraphs 1, 2 and 3 of said Bill of Complaint.

II.

The defendant denies each and all of the allegations contained in paragraph 4 of said Bill of Complaint, and the defendant avers, on information and belief, that the said Samuel B. Smith was not the true, original and first inventor of any of the alleged improvements in incubators, or in methods of hatching eggs disclosed in the Smith patent in suit, 1,262,860, of April 16, 1918, and pointed out in the relied upon claims thereof numbered 1 and 2, but that, on the contrary all of said alleged improvements in incubators or in methods of hatching eggs, disclosed in said patent and pointed out in said relied upon claims, were old and well known in the prior art, had been patented and described in numerous prior patents and had been in public use in the United States by said Samuel B. Smith and others and been abandoned to the public at dates more than two years before the said Samuel B. Smith filed his application which matured into said Smith patent 1,262,860 here in suit.

III.

Having regard to the allegations made in paragraphs 5, 6, 7, and 8 of said Bill of Complaint, the defendant
8 admits that said Samuel B. Smith did, on the 26th day of October, 1916, file in the U. S. Patent Office, an application for U. S. Letters Patent, and that, on April 16, 1918, the patent in suit, 1,262,860, was issued to the Buckeye Incubator Company as the alleged assignee of said Samuel B. Smith, but the Defendant denies each and every other allegation contained in said paragraphs 5, 6, 7 and 8, and avers, on information and belief, that the said application for patent was filed by said Samuel B. Smith, in violation of the law, and that said patent in suit, 1,262,860, of April 16, 1918, was granted by the Commissioner of Patents to said Buckeye Incubator Company in violation of the law; and the defendant further avers on information and belief, that the alleged assignment identified in paragraph 7 of the Bill of Complaint

was an illegal instrument inconsistent with other existing written contracts previously executed by said Samuel B. Smith and said Buckeye Incubator Company, and which was, therefore, ineffective to invest in said Samuel B. Smith, any exclusive title or interest in the said patent, and hence, defendant further avers on information and belief, that the said Samuel B. Smith, the plaintiff herein, has no title to the patent in suit and has no right to bring this suit, or any suit under the said patent.

IV.

The defendant, on information and belief, denies each and every allegation contained in paragraph 9 of said Bill of Complaint.

V.

Respecting the two allegations contained in paragraph 10 of said Bill of Complaint, the defendant, on information and belief, denies the first thereof (relating to the marking of plaintiff's incubators) and admits the second (relating to the alleged notice of infringement given by the plaintiff to defendant); but the defendant avers that, immediately after receiving the said notice of alleged infringement, he had a careful investigation made by competent patent attorneys, and was advised by said attorneys that said charge of infringement was ill-founded and unsustainable in the Courts and that, in the opinion of said attorneys, the
9 defendants were not infringing any of the claims of the Smith patent in suit, 1,262,860.

VI.

The defendant, upon information and belief, denies each and all of the allegations contained in paragraphs 11 and 12 of said Bill of Complaint; and the defendant avers, upon information and belief, that he has never, at any time or place, manufactured and sold, or offered for sale, within the United States, or elsewhere, any incubators embodying and operating in accordance with the alleged invention disclosed in said Smith patent in suit, 1,262,860, and pointed out in the relied upon claims thereof, numbered 1 and 2, or pointed out in any of the other claims of said patent, and has no intention of so doing; and the defendant further avers that he has never at any time or place within the United States, without the authority first duly received from the owner or owners of said Smith patent in suit, 1,262,860, ever used any incubators embodying and operating in accordance with the said alleged invention disclosed in said patent, and pointed out in said relied upon claims 1 and 2 thereof, or pointed out

in any other claims of said patent; and the defendant further avers, on information and belief, that he has never realized any profit or gain which, of right belongs to the plaintiff, and has never done any illegal act causing any loss, injury or damage to the plaintiff, and has never threatened so to do and has no intention of so doing.

VII.

Further answering, the defendant, on information and belief, avers that the said Samuel B. Smith patent in suit, 1,262,860, of April 16, 1918, applied for October 26, 1916, is, as to the relied upon claims 1 and 2 thereof, invalid and of no effect in law, for the reason that the alleged invention, or method of hatching eggs disclosed in said patent and pointed out in the relied upon claims 1 and 2 thereof, had been put into public commercial use by the said Samuel B. Smith in the United States, at Attica, Ohio, and at Cleveland, Ohio, at dates more than two years before the said Samuel B. Smith filed in the Patent Office his said application which matured into his said patent here in suit and this usage or practice of said invention was effected by said Smith at said places in incubators designed and built by him, or under his direction; and the hereinbelow named persons whose residences appear opposite their respective names, had knowledge of the said usage of said machines, at said places, to-wit:

Samuel B. Smith	Cleveland Ohio,
James W. Miller,	Bucyrus, Ohio.
Albert H. Wilson	Toledo, Ohio,
Edward H. Uhle,	Cleveland, Ohio,
Mr. & Mrs. Carrick,	Cleveland, Ohio;

and the defendant further alleges that one or more of the said incubating machines used by said Smith at Attica, and at Cleveland, Ohio, for carrying into effect his said method of hatching eggs disclosed in said patent in suit and pointed out in claims 1 and 2 thereof, was referred to and described in a newspaper article published in the Sunday Plain Dealer, of Cleveland, Ohio, in its issue of Sunday, February 23rd, 1913, entitled "Mammoth Incubator will Turn out 20,000 Chicks per Week", and also, in an article published in the Cleveland Leader, of Cleveland, Ohio, Sunday, February 22nd, 1914, entitled "Cleveland Boasts Largest Hatchery".

VIII.

Further answering, the defendant, on information and belief, avers that the said Samuel B. Smith patent in suit 1,262,860,

of April 16, 1918, applied for October 26, 1916. is, as to the relied upon claims 1 and 2 thereof, invalid and of no effect in law for the reason that the alleged invention or method of hatching eggs disclosed in said patent and pointed out in said relied upon claims 1 and 2 thereof, had been put into public use in the United States on Walter B. Davis' farm at Brooklyn, N. Y., and at Muskogee, Okla., and at Port O'Connor, Texas, by Milo M. Hastings, of New York City, at dates more than two years before the said Samuel B. Smith filed in the Patent Office his application which matured into said patent here in suit, and said usage of said invention was effected by said Milo M. Hastings in incubators designed and built by him or under his direction,
11 and the hereinbelow named persons, whose residences appear opposite their respective names, had knowledge of said usage, to-wit:—the following three persons had knowledge of said usage on the Walter B. Davis farm at Brooklyn, N. Y., namely:—

Milo M. Hastings, White Plains Road, Tarrytown, N. Y.
Walter B. Davis, Jersey City, N. J.
Edgar Chambless, 122 East 34th Street, New York City, N. Y.;

and the following four persons had knowledge of the said usage at Muskogee, Okla., to-wit:—

C. T. Brewer,	Muskogee, Okla.,
Mr. and Mrs. John G. Lieber,	Muskogee, Okla.,
Edward Hastain,	Phoenix, Arizona.,
Reese V. Hicks,	Kansas City, Mo.;

and the defendant further alleges that the structure and mode of operation of said Hastings incubator used by him at Muskogee, Okla., was described in an article entitled "The Mammoth Incubator Out-Mammothed", published at Topeka, Kansas, in a periodical entitled "Poultry Culture", issue for February 1912, Vol. XV. No. 5, pages 7, 14 and 15 thereof, copy in U. S. Department of Agriculture Library, Washington, D. C.; and the following persons had knowledge of said usage at Port O'Connor, Texas, to-wit:—

Milo M. Hastings,	White Plains Road, Tarrytown, N. Y.
E. T. Powers,	Port O'Connor, Texas.

IX.

Further answering, the defendant, on information and belief, avers that the said Samuel B. Smith patent in suit 1,262,-860, of April 16, 1918, applied for October 26, 1916, is, as to the relied upon claims 1 and 2 thereof, invalid and of no

effect in law, for the reason that the alleged invention or method of hatching eggs disclosed in said patent and pointed out in said relied upon claims 1 and 2 thereof, had been put into public use in the United States, by Rolla Lawry, at Pacific, Missouri, at dates more than two years before the said Samuel B. Smith filed in the Patent Office his application which matured into his said patent here in suit, and said usage of said alleged invention at Pacific, Mo., was effected by said Rolla Lawry in one or more incubators designed and built by him, or under his direction, and operated by him at the said place, and the hereinbelow named person whose residences appear opposite their respective names, had knowledge of said usage, to-wit:—

Rolla Lawry, 336 Orchard Ave., Webster Groves, St. Louis, Mo.,
Gordon A. Scott, 300 South Walnut Street, Seymour, Indiana.

12 and others now unknown to the defendant, but whose names and addresses, when ascertained, the defendant prays leave to add by amendment to this, his Answer in this suit.

X.

The defendant, further answering, avers, on information and belief, that the said Samuel B. Smith patent in suit, 1,262,860, of April 16, 1918, is, as to the relied upon claims 1 and 2 thereof, invalid and of no effect in law, for the reason that said Samuel B. Smith was not the true, original and first inventor of the method of hatching eggs, disclosed in said patent and pointed out in said relied upon claims 1 and 2 thereof, but that, on the contrary, Milo M. Hastings, of White Plains Road, Tarrytown, New York, was the true, original and first inventor of said method of hatching eggs, and was using reasonable diligence in adapting and perfecting the said invention and had reduced the same to successful practice in the United States before the same was invented or produced by said Samuel B. Smith, and that the said patent in suit was unjustly granted on an application surreptitiously and illegally filed by said Samuel B. Smith and was unjustly and illegally issued in the name of the Buckeye Incubator Company as the assignee of said Samuel B. Smith.

XI.

The defendant, further answering, avers, on information and belief, that the said Samuel B. Smith patent in suit 1,262,860, of April 16, 1918, is, as to the relied upon claims 1

and 2 thereof, invalid and of no effect in law, for the reason that said Samuel B. Smith was not the true, original and first inventor of the method of hatching eggs, disclosed in said patent and pointed out in said relied upon claims 1 and 2 thereof, but that, on the contrary, Rolla Lawry, of 336 Orchard Avenue, Webster Groves, St. Louis, Missouri, was the true, original and first inventor of said method of hatching eggs and was using reasonable diligence in adapting and perfecting said invention and had reduced the same to successful practice in the United States at Pacific, Missouri, before the said method of hatching eggs was invented or produced by said Samuel B. Smith, and that said patent in suit was issued on an application surreptitiously and illegally filed by said Samuel B. Smith and was unjustly and illegally issued to the Buckeye Incubator Company as the assignee of said Samuel B. Smith.

XII.

Further answering, the defendant avers, on information and belief, that the said Samuel B. Smith patent in suit, 1,262,860, of April 16, 1918, is, as to the relied upon claims 1 and 2 thereof, invalid and of no effect in law, for the reason that the alleged invention or method of hatching eggs, disclosed in said patent and pointed out in said relied upon claims 1 and 2 thereof, did not constitute any patentable invention over the prior art existing in the United States at the time when said alleged invention or method of hatching eggs was produced by said Samuel B. Smith and the production of said method of hatching eggs by said Samuel B. Smith did not involve the exercise of the inventive faculties of the human mind, under the law of the subject, but only involved the ordinary mechanical skill and judgment naturally to be expected from any mechanic familiar with the said prior art; and that certain material portions of said prior art as it then existed in the United States have been identified in the foregoing paragraphs VII, VIII, and IX, of this Answer, and that other material portions of which prior art are disclosed in the hereinbelow identified patents and the hereinbelow identified publications, to-wit:

Group A.

Prior Patents Cited On The File Wrapper Record Of The Smith Patent In Suit, 1,262,860, of April 16, 1918.

U. S. No. 120,253, Oct. 24, 1871, H. Endemann, "Improvement in Apparatus for Drying Fruits, Meat, Etc."

U. S. No. 152,644, June 30, 1874, E. A. Jones and C. W. Jones, "Fruit-Driers".

U. S. 272,744, Feb. 20, 1883, A. H. Morgan, "Incubator".

U. S. No. 286,756, Oct. 16, 1883, C. F. Winkler, "Incubator".

U. S. No. 297,676, Apr. 29, 1884, G. Conant, "Device for Preserving Eggs".

14 U. S. No. 330,457, Nov. 17, 1885, C. Bassini, et al., "Incubator".

U. S. No. 344,474, June 29, 1886, J. W. Campbell, "Heat Regulating Attachment for Incubators".

U. S. No. 559,676, May 5, 1896, T. R. C. Christianson, "Storing Eggs and Apparatus for Turning Them to Keep Them Fresh".

U. S. No. 591,870, Oct. 19, 1897, F. H. Morgan, "Incubator".

U. S. No. 691,837, Jan. 28, 1902, V. S. Bell, "Incubator".

U. S. No. 709,650, Sept. 23, 1902, O. P. Scott, "Incubator".

U. S. No. 745,458, Dec. 1, 1903, F. C. Perkins, "Electrical Incubator".

U. S. No. 828,181, Aug. 7, 1906, G. H. Boyd, "Incubator".

U. S. No. 891,019, June 16, 1908, L. Verna, "Drying Room".

U. S. No. 916,454, Mar. 30, 1909, V. C. Koons, "Incubator".

U. S. No. 949,653, Feb. 15, 1910, J. H. Klinke, "Incubator".

U. S. No. 1,100,146, June 16, 1914, J. O. Olson, "Incubator".

U. S. No. 1,137,752, May 4, 1915, G. E. Goldstein, "Apparatus for Curing or Artificially Aging Cigars".

U. S. No. 1,160,793, Nov. 16, 1915, S. S. Van Keuren, "Incubator".

German Pat. No. 155,917, Nov. 7, 1901, E. Stulik, "Incubating Process and Device for Group Charging and Simultaneous Treatment of the Groups of Eggs Inserted at Different Times into the Incubating Apparatus".

Group B.

Prior Patents, None Of Which Were Cited On The File Wrapper Record Of The Smith Patent In Suit, 1,262,860, Of April 16, 1918.

U. S. No. 3,019, Mar. 30, 1843, N. E. Guerin, "Egg Hatching Apparatus".

U. S. No. 193,616, July 31, 1877, E. S. Renwick, "Incubator".

U. S. No. 217,148, July 1, 1879, E. S. Renwick, "Incubator".

U. S. No. 224,224, Feb. 3, 1880, E. S. Renwick, "Incubator".

U. S. No. 271,184, Jan. 23, 1883, H. Altenbrand, "Malt Kiln".

U. S. No. 280,490, July 3, 1883, O. Lumpp, "Method of and Means for Drying Materials of Extensive Superficial Area".

U. S. No. 335,961, Feb. 9, 1886, E. S. Renwick, "Incubator".

U. S. No. 320,463, June 23, 1885, Lewis Cutting, "Egg Timing Device for Incubators".

U. S. No. 426,321, Apr. 22, 1890, J. K. Proctor & J. H. Knowles, "Drying Machine".

U. S. No. 456,407, July 21, 1891, F. Frey & A. M. Wayne, "Incubator".

U. S. No. 535,175, Mar. 5, 1895, C. W. Schwartz, "Method of and Apparatus for Ordering Tobacco".

U. S. No. 553,723, Jan. 28, 1896, J. K. Proctor, "Apparatus for Ordering Tobacco".

U. S. No. 586,088, July 6, 1897, W. P. Jones, "Incubator and Brooder".

(This Incubator Patent 586,088, was declared invalid for lack of invention over two prior patents for heating and ventilating houses in a decision rendered by the Circuit Court of Appeals for the Second Circuit Nov. 24, 1903, in a case entitled Jones vs. Cyphers, et al., reported in Volume 126 of Federal Reporter, page 753).

15 U. S. No. 599,145, Feb. 15, 1898, George Kutz, "Incubator".

U. S. No. 614,493, Nov. 22, 1898, C. S. Newsom, "Combined Incubator and Brooder".

U. S. No. 789,719, May 16, 1905, J. M. Day, "Incubator".

U. S. No. 798,697, Sept. 5, 1905, F. C. Perkins, "Incubator".

U. S. No. 832,151, Oct. 2, 1906, C. S. Newsom, "Combined Incubator and Nursery".

U. S. No. 992,622, May 16, 1911, J. Wiebe, "Egg Drier".

U. S. No. 1,010,809, Dec. 5, 1911, J. Schmidt & H. Schutterle, "Apparatus for Drying Macaroni and Like Bakery Products".

U. S. No. 1,034,205, July 30, 1912, J. C. Cogburn, "Drier".

U. S. No. 1,075,747, Oct. 14, 1913, C. W. Zimmer, "Semifireless Incubator".

U. S. No. 1,086,903, Feb. 10, 1914, A. Di Domenica & A. Amicarelli, "Drier".

U. S. No. 1,158,447, Nov. 2, 1915, C. J. Coleman, "Poultry Producing Apparatus".

U. S. No. 1,195,705, Aug. 22, 1916, P. S. Martin, "Automatic Egg Turning Device".

U. S. No. 360,223, Mar. 29, 1887, E. H. Johnson, "Electrical Apparatus for Heating and Cooling Buildings".

U. S. No. 843,909, Feb. 12, 1907, F. M. Peters & H. H. Hungerford, "Atmosphere Regulating System".

U. S. No. 917,483, Apr. 6, 1909, C. C. Peck, "Automatic Fan System of Heating".

U. S. No. 946,911, Jan. 18, 1910, G. C. Andrews, "Heating Plant".

And other prior patents now unknown to the defendant, but which, when discovered, he prays leave to add to this, his Answer to the Bill of Complaint in this suit.

Group C.

Publications.

The publications identified in paragraphs VII and VIII, of this Answer.

A book by Milo M. Hastings (pages 104-105), entitled "The Dollar Hen", published by the Arcadia Press, N. Y., 1909. Copy in New York Public Library.

An article entitled "Indoor Chicken Factories", published in the Boston Sunday Globe, of Boston, Mass., issue of November 10, 1912. Copy in the office of the Boston Globe, Boston, Mass.

An article entitled "Hatching Chickens by Wholesale", published in the Technical World, of Chicago, Illinois, issue

of April 1913, (pages 248-249). Copy in New York Public Library, N. Y.

An article entitled "Incubator" appearing on pp. 652-653 of Ure's Dictionary of Arts, Manufactures and Mines,
16 published in London, England, by Longmans, Green & Co. in 1867 (copy in Minneapolis Public Library).

An article entitled "Incubator", appearing on pages 1177 and 1178 of Knight's American Mechanical Dictionary, Vol. II, published at Boston, Mass., by Houghton, Mifflin & Company, 1884.

An article entitled "Ventilator", appearing on pages 2704 and 2705 of Knight's American Mechanical Dictionary, Vol. III, published at Boston, Mass., by Houghton, Mifflin & Company, 1884, and particularly the cut (Fig. 6960) appearing on page 2705, entited "Sectional View of the Senate Wing, United States Capital, showing the Pressure and Exhaust Ventilating Apparatus", and the description thereof, which appears on the said page directly below the said cut.

And other publications, now unknown to this defendant, but which, when discovered, he prays leave to add by amendment to this, his Answer in this suit.

XIII.

The defendant, further answering, avers, on information and belief, that, in view of the Patent Office file wrapper record of said Samuel B. Smith's patent, 1,262,860, of April 16, 1918, here in suit, the said Samuel B. Smith, his heirs, legal representatives and assigns, and the Buckeye Incubator Company, its successors and assigns including the plaintiff in this suit, are estopped from receiving any interpretation of the relied upon claims 1 and 2 of said patent in suit, which would accord to said claims, or either thereof, any meaning broad enough in scope to include any methods of hatching eggs ever, anywhere in the United States, carried into effect by any incubator ever made and sold by the defendant in the United States, or ever, anywhere used in the United States, by said defendant, without the authority of the owners of said Smith patent in suit, first had and received.

XIV.

The defendant, further answering, avers, on information and belief, that, in view of the prior art, identified or
17 referred to in paragraph XII of this Answer, it is not possible to give to the relied upon claims 1 and 2 of

the Smith patent, 1,262,860, here in suit, or either thereof, any meaning under which the said claims, or either thereof, could be held to be valid over said prior art, and, at the same time, include and cover any method of hatching eggs, ever, anywhere in the United States, carried in effect by any incubator ever made and sold by the defendant in the United States, or ever, anywhere used by the defendant in the United States without the authority of the owners of said Smith patent in suit, first had and received.

XV.

The defendant, further answering, avers that the said Smith patent in suit, 1,262,860, of April 16, 1918, as to the relied upon claims 1 and 2 thereof, has been adjudicated in the hereinbelow identified cases, and that, in all of said cases, the Bills of Complaint were dismissed, for non-infringement, to-wit:—

Buckeye Incubator Co., et al., vs. Blum, 17 F. R. (2) 456, affirmed by the Circuit Court of Appeals for the Sixth Circuit in a decision rendered July 6, 1928, reported in 27 F. R. (2) 333;

Buckeye Incubator Co. and Samuel B. Smith vs. Ira W. Petersime, et al., in a decision of District Judge Hickenlooper rendered June 30, 1926, (unreported in the Federal Reporter), affirmed by the Circuit Court of Appeals for the Sixth Circuit June 10, 1927, 19 F. R. (2) 721.

Buckeye Incubator Co. et al., vs. Hillpot, 22 F. R. (2) 855, affirmed by the Circuit Court of Appeals for the Third Circuit, in a decision rendered February 10, 1928, reported in 24 F. R. (2) 341.

Buckeye Incubator Co. and Samuel B. Smith vs. Bert W. Boling, trading as the Brownstown Poultry Farm of Brownstown, Indiana, this being Equity Case No. 812, in the United States District Court of the District of Indiana, Indianapolis, Division, which was tried before District Judge Thomas W. Slick in January, 1926, who dismissed the plaintiff's Bill of Complaint by a Decree signed and filed by him February 8, 1926, and which Decree became final (unreported in Federal Reporter); and which case is referred to in the decision of the trial court (Judge Hough) in Boling vs. Buckeye Incubator Co. et al., 33 F. R. (2) 347, and in which decision the structure and operation of the Boling incubator is described. (See pages 350-351.)

18 And said defendant further avers that, in all of said cases carried up to the respective Circuit Court of

Appeals above named, said claims 1 and 2 of said Smith patent in suit were construed to be of very limited scope, in view of the prior art and the file wrapper record of the said Smith patent, 1,262,860; and the defendant further avers, on information and belief, that the meanings accorded to said claims by the said Courts, in said cases, were of such narrow scope that they do not include and cover any method of hatching eggs ever, anywhere in the United States, carried into effect by any incubator ever made and sold by the defendant in the United States, or ever, anywhere used in the United States by said defendant, without the authority of the owners of said Smith patent in suit first had and received.

XVI.

Said defendant, further answering, on information and belief, denies the equity of plaintiff's Bill of Complaint, denies that the plaintiff is entitled to any profit or damages from the defendant, or to any injunction, temporary or permanent, or to any accounting, or to any cost of suit, or to any part of the relief in said Bill of Complaint demanded, or to any relief whatsoever.

All of which statements and defenses this defendant is ready to aver, maintain and prove as this Honorable Court shall direct and, hence, he prays to be dismissed with his reasonable costs and charges in his behalf most wrongfully sustained.

E. H. SNOW,
doing business under the names, "Snow's Hatcheries" and "Snow's Incubator Company", Defendant.

Williamson & Williamson
Counsel for Defendant,
925 Metropolitan Life Bldg.,
Minneapois, Minnesota.

James F. Williamson,
Of Counsel for Defendant.

(Endorsed): Filed Nov. 2, 1931. Joel M. Dickey, Clerk. By Thomas H. Howard, Deputy.

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19 (Order that Defendants Prepare Further and Better Statement Specifying Patents, etc., upon Which They Will Rely.)

This cause came on for hearing upon an Order directing Defendants to show cause why they should not specify which

of the patents, publications and uses they intend to rely at trial as anticipations of the two claims of the patent in suit.

Upon consideration of the pleadings herein, arguments of counsel for both sides, it is hereby

Ordered that Defendants prepare a further and better statement specifying which of the patents, publications and uses peaded in the Answer, as amended, will be relied upon at trial as anticipations of the two claims in suit, serve a duplicate copy of such statement upon plaintiff's solicitors, and file the original with the Clerk of this Court on or before three o'clock, P. M. of Tuesday, November 8, 1932.

GUNNAR H. NORDBYE,
United States District Judge.

November 5, 1932.

(Endorsed): Filed Nov. 5, 1932. Joel M. Dickey, Clerk. By Thomas H. Howard, Deputy.

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20 (Notice to Plaintiff of Response of Defendants to Order Directing Them to Prepare Further and Better Statement Specifying Patents, etc.)

Messrs. Paul, Paul & Moore,
700 Security Bldg.,
Minneapolis, Minnesota.

Gentlemen:—

Herewith we submit to your inspection the original of the defendant's response to the Court's order of Nov. 5, 1932, and deliver to you a copy thereof.

Kindly acknowledge service.

WILLIAMSON & WILLIAMSON,
Attorneys for Defendant.

Dated Nov. 7, 1932.

Service of the above notice, the original of the document therein referred to and the receipt of copies of said notice and document is hereby acknowledged this 7th day of November, 1932.

PAUL, PAUL & MOORE.

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21 (Response of Defendants to Order Directing Them to Prepare Further and Better Statement Specifying Patents, etc., upon Which They Will Rely.)

In response to the order of the Court signed and filed by his Honor, Judge Gunnar H. Nordbye, November 5, 1932, comes now the defendant in the above entitled case, by his attorneys of record, and makes and files the following statement:—

At the trial of this case, the defendant will rely upon the hereinbelow identified record, the hereinbelow identified prior patents, the hereinbelow identified prior publications, and the hereinbelow identified prior uses, to establish the respective defenses for which the same were set up in the defendant's answer to the plaintiff's Bill of Complaint including the defenses of anticipation (for lack of novelty) want of invention over the prior art and non-infringement of the relied upon claims of the Smith patent in suit:—

1. The defendant will rely upon the file wrapper record of the Smith patent No. 1,262,860, of April 16, 1918, in suit, and the prior U. S. and foreign patents which were cited as references on the said file wrapper record and which references are specifically identified in paragraph XII of the defendant's answer under the heading "Group A".

2. Of the twenty-nine prior U. S. Patents set up in paragraph XII of the defendant's answer under the heading "Group B", the defendant will rely upon the thirteen thereof hereinbelow identified to-wit:—

22 3,019, Mar. 30, 1843, Guerin, "Egg Hatching Apparatus",

193,616, July 31, 1877, Renwick, "Incubator",

335,961, Feb. 9, 1886, Renwick, "Incubator",

456,407, July 21, 1891, Frey & Wayne, "Incubator",

535,175, Mar. 5, 1895, Schwartz, Jr., "Method of and Apparatus for ordering tobacco"

553,723, Jan. 28, 1896, Proctor, "Apparatus for Ordering Tobacco",

586,088, July 6, 1897, Jones, "Incubator and Brooder",

992,622, May 16, 1911, Wiebe, "Egg Drier",

1,010,809, Dec. 5, 1911, Schmidt & Schütterle, "Apparatus for Drying Macaroni and Like Bakery Products",

1,075,747, Oct. 14, 1913, Zimmer, "Semifireless Incubator",

360,223, Mar. 29, 1887, Johnson, "Electrical Apparatus for Heating and Cooling Buildings",

426,321, Apr. 22, 1890, Proctor & Knowles, "Drying Machine",

843,909, Feb. 12, 1907, Peters & Hungerford, "Atmosphere Regulating System".

3. Of the publications set up in paragraphs VII, VIII and in XII, under the heading "Group C", the defendant will rely upon those hereinbelow identified, to-wit:

The newspaper article published in the Sunday Plain Dealer, of Cleveland, Ohio, in its issue of Sunday, February 23rd, 1913, entitled "Mammoth Incubator will turn out 20,000 Chicks per week" and

The article published in the Cleveland Leader of Cleveland, Ohio, in its issue of Sunday, February 22nd, 1914, entitled "Cleveland Boasts Largest Hatchery".

An article entitled "Incubator" appearing on pages 652-653 Vol. 2 of Ure's Dictionary of Arts, Manufactures and Mines published in London, England by Longmans, Green and Co., in 1867, (copy in Minneapolis Public Library).

An article entitled "Incubator", appearing on pages 1177 and 1178 of Knight's American Mechanical Dictionary Vol. II, published at Boston, Mass., by Houghton, Mifflin & Company, 1884.

An article entitled "Ventilator", appearing on pages 2704, and 2705 of Knight's American Mechanical Dictionary, Vol. III, published at Boston, Mass., by Houghton, Mifflin & Company, 1884, and particularly the cut (Fig. 6960) appearing on page 2705, entitled "Sectional View of the Senate Wing United States Capitol, showing the Pressure and Exhaust Ventilating Apparatus", and the description thereof, which appears on the said page directly below the said cut.

23 4. Of the prior uses set up in the defendant's answer, the defendant will rely on the prior usage by Samuel B. Smith, himself, set up in paragraph VII of the defendant's answer.

Signed at Minneapolis, Minnesota, this 7th day of November, 1932.

WILLIAMSON & WILLIAMSON,
Attorneys for Defendant.

(Endorsed): Filed Nov. 7, 1932, Joel M. Dickey, Clerk. By Thomas H. Howard, Deputy.

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24 (Stipulation as to Introduction of Uncertified Copies of Letters Patents, etc.)

It is hereby stipulated that on the trial of the above entitled case the following things may be done:—

1. In case the parties to said suit, or either thereof, shall desire to introduce into evidence any U. S. or foreign patents set up in the Defendant's answer to the Plaintiff's Bill of Complaint, and in the Defendant's response to the Court's order of November 5th, 1932, then the official printed copies of said U. S. patents, uncertified, and the official copies of any foreign patents procured from the U. S. Patent Office, certified, may be introduced and used in evidence with the same force and effect as if certified copies had been procured from the respective Patent Offices or the departments of government issuing said patents had been procured and introduced into evidence.

2. As to all publications set up in the Defendant's answer to the Plaintiff's Bill of Complaint in said suit, and also in the Defendant's response to the Court's order of November 5th, 1932, that uncertified photostatic copies of the articles appearing therein and identified in said answer and response may be offered and used in evidence with the same force and effect as if the original publications had been produced and identified and authenticated by competent witnesses.

3. Defendant admits title to the patent in suit in the plaintiff Samuel B. Smith.

Signed at Minneapolis, Minnesota, this 14th day of November, 1932.

A. L. ELY,
Counsel for Plaintiff.

WILLIAMSON & WILLIAMSON,
Counsel for Defendants.

(Endorsed): Filed Nov. 16, 1932, Joel M. Dickey, Clerk. By Thomas H. Howard, Deputy.

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973 (Opinion of District Court.)

The above entitled action came on for trial and was duly tried to the Court at the Federal Building in Minneapolis, Minnesota, commencing on November 16, 1932.

Albert L. Ely, Esq., of Cleveland, Ohio, and Messrs. Paul, Paul and Moore, represented by Harold Olson, Esq., appeared on behalf of the plaintiff;

Messrs. Williamson & Williamson, represented by James F. Williamson, Esq., and Ralph E. Williamson, Esq., appeared on behalf of the defendants.

After duly considering all of the files and records herein, the evidence adduced at the trial, the arguments of counsel and the briefs of counsel, I find and hold as Conclusions of Law, Findings of Fact and Mixed Law and Fact as follows:

1. That the plaintiff, Samuel B. Smith, was at he time of the commencement of this action and still is a citizen of the United States and a resident of Cleveland, Ohio.

2. That the defendant, E. H. Snow, did at the time of the commencement of this action and still does reside at Sleepy Eye, Brown County, Minnesota, and that E. H. Snow
974 doing business as Snow's Hatcheries and Snow's Incubator Company, was, at the time of the commencement of this action and still is located at Sleepy Eye, Brown County, Minnesota, where the defendants are engaged in and doing business in the commercial hatching of eggs.

3. This suit is one arising under the patent laws of the United States and this Court has jurisdiction thereof.

4. On October 26, 1916, the plaintiff, Samuel B. Smith, filed in the United States patent office an application for letters patent of the United States for said improvement.

5. That prior to April 16, 1918, Samuel B. Smith assigned the right, title and interest in and to said invention and in and to any United States patent to issue thereon to The Buckeye Incubator Company, a corporation of Ohio, and that after due proceedings upon said application for patent there was issued to The Buckeye Incubator Company, aforesaid, United States Letters Patent No. 1,262,860 on April 16, 1918, whereby the exclusive right of making, using and selling the said invention and improvements throughout the United States for the term of said patent was granted to The Buckeye Incubator Company, aforesaid, its successors or assigns.

6. That under date of April 29, 1927, The Buckeye Incubator Company, aforesaid, being then the owner of the title in and to the aforesaid Letters Patent, did sell, assign and transfer to the plaintiff, Samuel B. Smith, his heirs and assigns, the right, title and interest in and to the said Letters Patent.

7. That the plaintiff and his predecessor in title, The
975 Buckeye Incubator Company, have been at all times the sole and exclusive owners of said patent.

8. That incubators manufactured and sold by the plaintiff have been marked "Patented" with the date and number of the patent aforesaid, as required by the Statutes of the United States, and that in addition the defendants herein were, before the commencement of this suit, duly notified in writing of the patent aforesaid and of their infringement thereof.

9. That the defendants prior to and not more than six years before the filing of the bill of complaint herein, have manufactured, sold and offered for sale to others and are using in the hatching of eggs at their place of business at Sleepy Eye, Minnesota, and other locations in Minnesota, incubators embodying and operating in accordance with the invention of said patent No. 1,262,860, and are threatening to continue the manufacture, sale and use of such incubators, thereby infringing the rights of the plaintiff as secured by the said patent, all without the license or consent of the plaintiff.

10. That by reason of the infringement complained of herein the plaintiff has suffered and is suffering loss and damage and the defendants have realized profits and gains which of right belong to the plaintiff.

11. The Smith patent 1,262,860 is not anticipated by any of the defenses and is valid, particularly as to claims 1 and 2 thereof.

12. The Smith patent is for a process of hatching eggs combining the steps of staged-incubation and forced-draft. These two steps have never been combined prior to two years before the filing of the Smith patent.

976 13. The Smith prior use and the publications thereof do not anticipate, as they do not disclose staged incubation.

14. Claims 1 and 2 of the patent cover the process of applying a forced draft to eggs in various stages of incubation located at different levels in a room which is closed except for small openings for the escape of limited amounts of foul and intake of corresponding amounts of fresh air.

15. Claims 1 and 2 of the patent are not limited in their terms or by the proceedings in the Patent Office to the setting of the eggs which are in various stages of incubation in any order or sequence, nor to the shifting of eggs during the

process, but on the contrary are of sufficient breadth to cover any arrangement of eggs in various stages of incubation.

16. The defendant in the incubator known as Plaintiff's Exs. 12 to 12KK and Defendant's Ex. F sets eggs in various stages of incubation.

17. Claims 1 and 2 of the Smith patent require the circulation of air through the eggs in current form by mechanical means such as fans or their equivalents, but the direction of the current is not essential.

18. The defendant, in the incubators identified in Finding 16 hereof circulates the air through the eggs in current form by mechanical means such as fans or their equivalents.

19. The Smith patent shows and describes a process in which the air moves in current form in repeated cycles over the eggs so that moisture is conserved, and the temperature is maintained substantially the same throughout the chamber by the carrying of the heat units from eggs
977 in later stages of incubation to eggs in earlier stages of incubation.

20. The Snow machines, identified in Finding 16 hereof, use a process in which the air moves and functions in the manner described in Finding 19 hereof.

21. Claim 1 is not limited in terms or by the proceedings in the Patent Office to the use of details of the apparatus such as the curtains, nor to the particular size, speed, location or arrangement of the fans shown in the patent.

22. Claim 1 is of sufficient breadth to cover a process in which the current movement of the air in defined paths is secured by mechanical means such as fans.

23. The defendant, in the machines identified in Finding 16 hereof, employes a process in which the current movement of the air in defined paths is secured by mechanical means such as fans.

24. The defendant, in the incubators identified in Finding 16 hereof, has infringed upon claim 1 of the patent.

25. Claim 2 of the Smith patent differs from claim 1 only in the inclusion of a "power driven" current of air; and in specifying that that current of air shall pass from an adjacent chamber through openings into the egg chamber.

26. The Snow incubators as specified in Finding 16 hereof use a "power driven" current and that current is created

in the chamber at the rear of the egg racks and passes through openings provided therefor around the egg racks and thence enters the egg racks.

27. The Snow incubators as specified in Finding 16
978 hereof infringe upon claim 2 of the Smith patent.

28. That a decree shall be entered finding the patent in suit unanticipated and valid and claims 1 and 2 thereof infringed; an injunction shall be issued forbidding the continued use by the defendant of the machines similar to those identified in Finding 16 hereof, or of any machines embodying the invention of the patent in suit and either claims 1 or 2 thereof; and the defendant shall be required to account for all gains and profits which he shall have made by the use of those machines or any machines embodying the Smith invention.

Dated this 7th day of February, 1933.

JOSEPH W. MOLYNEAUX,
United States District Judge.

(Endorsed): Filed Feb. 7, 1933, Joel M. Dickey, Clerk, By Thomas H. Howard, Deputy.

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979 (Interlocutory Decree, February 11, 1933.)

In the United States District Court, District of Minnesota, Fourth Division.

Samuel B. Smith, Plaintiff,
No. 2119. vs. Equity.
E. H. Snow and D. H. Snow, d. b. a. Snow's Hatcheries and Snow's Incubator Company, Defendant.

This cause came on for trial before the Court at this term on November 16, 1932, and after duly considering all of the files and records herein, the evidence adduced at the trial, the arguments of counsel and the briefs of counsel, It Is

Ordered, Adjudged And Decreed as follows:—

1. That the Letters Patent of the United States, granted to Samuel B. Smith on Incubators, No. 1,262,860, dated April 16, 1918, being the Letters Patent in suit, are good and valid in law, as to claims 1 and 2 thereof.

2. That the plaintiff, Samuel B. Smith, is the sole and exclusive owner of the entire right, title and interest in and to said Letters Patent No. 1,262,860.

3. That the defendants, E. H. Snow and E. H. Snow, d. b. a. Snow's Hatcheries and Snow's Incubator Company, have infringed said claims 1 and 2 of said Smith's Letters Patent in suit, No. 1,262,860, of April 16, 1918, and have violated the exclusive rights of the plaintiff thereunder, by the hatching of eggs within the jurisdiction of this Court, in accordance with the methods of hatching eggs, disclosed in said patent and defined in claims 1 and 2 thereof.

4. That a writ of injunction issue out of and under the seal of this Court, directed to the said defendants, E. H. Snow and E. H. Snow, d. b. a. Snow's Hatcheries and Snow's Incubator Company, enjoining and restraining the
980 said defendants, and each of them, their officers, directors, associates, attorneys, clerks, servants, agents, workmen, employees, and confederates, and each of them, throughout the remainder of the life of said Smith patent in suit, No. 1,262,860, of April 16, 1918, and throughout the life of any extension thereof, which may hereafter be granted, from using, or causing to be used, for hatching eggs within the United States, any machine of the structure exemplified in the defendants' machine-Exhibit F, or illustrated in the plaintiff's drawings, Exhibits 12 to 12-KK, inclusive, and from directly or indirectly infringing, or causing to be infringed, said claims 1 and 2 of said Smith patent in suit, or either thereof.

5. That the plaintiff recover from the defendants the profits, gains and advantages, which the said defendants have received, or which may have accrued to them by reason of their said infringement of claims 1 and 2 of said Smith patent in suit, No. 1,262,860, of April 16, 1918.

6. That this cause be referred to Howard S. Abbott, Esq. as Special Master of this Court, who is hereby appointed to ascertain, state and report to the Court a true and correct account of the extent of the infringement by said defendants, or any thereof, of said claims 1 and 2 of said Smith patent in suit, No. 1,262,860, of April 16, 1918, and also the amount of the gains, profits and advantages, which said defendants have received from the said infringement of claims 1 and 2 of said patent, and the amount of the damages, which said plaintiff has suffered, if any, by reason of said defendants' infringement of said claims 1 and 2 of said patent; and the plaintiff, on said accounting, shall have the right to cause examination of the officers, servants, agents and employees of the defendants, ore tenus, or otherwise, and also to examine other witnesses and to cause production and examination of the books, vouchers and documents

of said defendants, and to have all necessary process of the Court to compel such attendance and production before the said Master, at such times, and places, as he shall, from time to time, direct.

981 7. That the plaintiff recover from the said defendants the taxable costs of the plaintiff in this Court and that the plaintiff shall have judgment and execution against the said defendants for said costs.

Dated at Minneapolis, Minnesota, this 11th day of February, 1933.

JOSEPH W. MOLYNEAUX,
U. S. District Judge.

Approved as to Form:

Williamson & Williamson,
Attorneys for Defendants.

Paul, Paul & Moore,
Attorneys for Plaintiff.

(Endorsed): Filed Feb. 11, 1933, Joel M. Dickey, Clerk, By Thomas H. Howard, Deputy.

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982 Petition for Appeal and Supersedeas Order.

To the Honorable Joseph W. Molyneaux, District Judge:—

The above named defendants, to-wit: E. H. Snow and E. H. Snow, d. b. a. Snow's Hatcheries and Snow's Incubator Company, considering themselves aggrieved by the Decree rendered and entered in the above entitled cause, on the 11th day of February, A. D., 1933, do hereby appeal from said Decree to the United States Circuit Court of Appeals for the Eighth Circuit, for the reasons set forth in the Assignments of Error to be filed herewith, and they pray that their appeal be allowed and that citation be issued, as provided by law, and that a transcript of the record, proceedings and documents upon which said Decree was based, duly authenticated, be sent to the United States Circuit Court of Appeals for the Eighth Circuit, under and in accordance with the rules of said Court in such cases made and provided.

And your Petitioners further pray that the allowance of said appeal be ordered to operate as a supersedeas, upon the defendants executing and filing with the Clerk of the Court, within 10 days from the date hereof, a bond in the

sum of Ten Thousand Dollars, as provided by law,
983 and that the Clerk be directed and ordered to stay the mandate of the District Court for the issue of an injunction and for an accounting, and for the taxation of costs, until the further order of this Court.

Signed at Minneapolis, Minnesota, this 16 day of February, A. D. 1933.

E. H. SNOW and
E. H. SNOW,
d. b. a. Snow's Hatcheries and
Snow's Incubator Company,
By Williamson & Williamson,
Their Attorneys of Record.

Order Allowing Appeal and Supersedeas.

It Is Hereby Ordered, This 16 day of February, 1933:— That the foregoing appeal be, and is hereby allowed, and that this allowance shall operate as a supersedeas upon the said Appellants filing their assignments of error and executing and filing with the Clerk of this Court, within 10 days from the date hereof, a bond in the sum of Ten Thousand Dollars, as provided by law; and it is hereby further ordered, that said allowance of said appeal shall operate as a supersedeas, and the Clerk is hereby ordered and directed to stay the mandate of the District Court for the issue of an injunction and for an accounting and the taxation of costs until the further order of this court.

JOSEPH W. MOLYNEAUX (Signed)
District Judge.

(Endorsed): Filed Feb. 16, 1933. Joel M. Dickey, Clerk. By Thomas H. Howard, Deputy.

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984 Bond on Appeal.

Know All Men By These Presents, That we, E. H. Snow and E. H. Snow, d. b. a. Snow's Hatcheries and Snow's Incubator Company, as Principal, and ..... as Sureties, are held and firmly bound unto Samuel B. Smith, the plaintiff, appellee in the above suit, in the sum of Ten Thousand Dollars, lawful money of the United States, to be paid the said Samuel B. Smith, his respective executors, administrators and successors; to which payment well and truly to be made, we bind ourselves, and each of us, jointly and

severally, and each of our heirs, executors and administrators by these Presents.

Sealed with our seals and dated this 20th day of February, 1933.

Whereas, the above named E. H. Snow and E. H. Snow, d. b. a. Snow's Hatcheries and Snow's Incubator Company, the defendant, appellant, has prosecuted an appeal to the United States Circuit Court of Appeals for the Eighth Circuit, to reverse the decree of the United States District Court, for the District of Minnesota, Fourth Division, rendered in the above entitled suit, on the 11th day of February, 1933;

Now, Therefore, the condition of this obligation is such, that if the above named E. H. Snow and E. H. Snow, d. b. a. Snow's Hatcheries and Snow's Incubator Company,
985 shall prosecute their said appeal to effect and answer all damages and costs, if they fail to make good their plea, then this obligation shall be void; otherwise to remain in full force and effect.

E. H. SNOW,
E. H. SNOW,
Doing business as Snow's Hatcheries and Snow's Incubator Company.

SEABOARD SURETY COMPANY,
By David R. Arundel,
Its Attorney-in-Fact.

(Corporate Seal)

State of Minnesota,
County of Hennepin—ss.

On the 20th day of February, 1933, personally appeared before me E. H. Snow, of Sleepy Eye, Minnesota, known to me to be the person described in and who duly executed the foregoing instrument as the Principal thereto, and acknowledged that he executed the same as his free act and deed for the purposes therein set forth.

ERIC A. MONROE.

Subscribed and sworn to before me this 20th day of February, 1933.

ERIC A. MONROE,
Notary Public, Hennepin County, Minnesota.

(Notarial Seal)

My commission expires July 15, 1933.

State of Minnesota,
County of Hennepin—ss:

On this 20th day of February, 1933, before me personally appeared David R. Arundel, with whom I am personally acquainted, who, being by me duly sworn, said; that he resides in the City of Minneapolis, County of Hennepin; that he is the Attorney-in-Fact of the Seaboard Surety Company, the corporation described in and which executed the foregoing instrument; that he knows the corporate seal of the said Company; that the seal affixed to said instrument is such corporate seal; that said instrument was executed in behalf of said corporation by authority of its Board of Directors and that he signed his name thereto as Attorney-in-Fact by like authority; and said David R. Arundel acknowledges said instrument to be the free act and deed of said Company, and that the liabilities of the said Company do not exceed its assets, as ascertained in the manner provided in Chapter 33, of the Laws of 1909 constituting Chapter 28 of the Consolidated Laws of the State of New York, and known as the Insurance law.

JANET L. OLSON,
(Notarial Seal) Notary Public, Hennepin County, Minn.
My commission expires 1/16/38

The above bond is hereby approved, both as to sufficiency and to form, this 21st day of February, 1933.

JOSEPH W. MOLYNEAUX,
District Judge.

(Endorsed): Filed Feb. 21, 1933. Joel M. Dickey, Clerk. By Thomas H. Howard, Deputy.

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986 Assignment of Errors.

Now come E. H. Snow and E. H. Snow, d. b. a. Snow's Hatcheries and Snow's Incubator Company, the defendants in the above entitled cause, and file the following assignments of errors, upon which they will rely upon the prosecution of their appeal herein from the decree signed and filed by this Honorable Court February 11, 1933:—

I.

The Court erred in decreeing the Samuel B. Smith U. S. Letters Patent No. 1,262,860, of April 16, 1918, in suit, to be good and valid in law, as to claims 1 and 2 thereof.

II.

The Court erred in not decreeing said Samuel B. Smith's U. S. Letters Patent No. 1,262,860, of April 16, 1918, in suit, to be invalid in law, as to claims 1 and 2 thereof, for lack of novelty and want of invention over the proven prior art.

III.

The Court erred in decreeing that the defendants had infringed said claims 1 and 2 of the said Samuel B. Smith's U. S. Letters Patent, No. 1,262,860, of April 16, 1918, in suit.

IV.

The Court erred in not decreeing that the defendants had not infringed said claims 1 and 2 of said Samuel B. Smith's U. S. Letters Patent No. 1,262,860, of April 16, 1918, in suit.

V.

The Court erred in decreeing that a writ of injunction should be issued out of and under the seal of the Court,
987 restraining and enjoining the defendants, and each thereof, as provided in paragraph 4 of the Decree.

VI.

The Court erred in decreeing that the plaintiff should recover from the defendants the profits, gains and advantages, which the said defendants had received, or which may have accrued to said defendants from the acts of the defendants referred to in paragraph 5 of the Decree.

VII.

The Court erred in decreeing that the cause be referred to a Special Master of the Court, for an accounting of profits and damages, accrued or accruing to the plaintiff from the defendants' acts, as stated in paragraph 6 of the Decree.

VIII.

The Court erred in decreeing that the plaintiff should recover from the defendants the taxable costs of the plaintiff in that Court, and that the plaintiff should have judgment and execution against the said defendants for said costs.

IX.

The Court erred in its finding numbered 9; and which finding reads as follows:—

"9. That the defendants prior to and not more than six years before the filing of the bill of complaint herein, have

manufactured, sold and offered for sale to others and are using in the hatching of eggs at their place of business at Sleepy Eye, Minnesota, and other locations in Minnesota, incubators embodying and operating in accordance with the invention of said patent No. 1,262,860, and are threatening to continue the manufacture, sale and use of such incubators, thereby infringing the rights of the plaintiff as secured by the said patent, all without the license or consent of the plaintiff."

X.

The Court erred in its finding numbered 10; and which finding reads as follows:—

"10. That by reason of the infringement complained of herein the plaintiff has suffered and is suffering loss
988 and damage and the defendants have realized profits and gains which of right belong to the plaintiff."

XI.

The Court erred in its finding numbered 11; and which finding reads as follows:

"11. The Smith patent 1,262,860, is not anticipated by any of the defenses and is valid, particularly as to claims 1 and 2 thereof".

XII.

The Court erred in its finding numbered 12; and which finding reads as follows:

"12. The Smith patent is for a process of hatching eggs combining the steps of staged-incubation and forced-draft. These two steps have never been combined prior to two years before the filing of the Smith patent".

XIII.

The Court erred in its finding numbered 13; and which finding reads as follows:

"13. The Smith prior use and the publications thereof do not anticipate, as they do not disclose staged incubation".

XIV.

The Court erred in its finding numbered 14; and which finding reads as follows:

"14. Claims 1 and 2 of the patent cover the process of applying a forced draft to eggs in various stages of incubation located at different levels in a room which is closed ex-

cept for small openings for the escape of limited amounts of foul and the intake of corresponding amounts of fresh air."

XV.

The Court erred in its finding numbered 15; and which finding reads as follows:

"15. Claims 1 and 2 of the patent are not limited in their terms or by the proceedings in the Patent Office to the setting of the eggs which are in various stages of incubation in any order or sequence, nor to the shifting of eggs during the process, but on the contrary are of sufficient breadth to cover any arrangement of eggs in various stages of incubation."

XVI.

The Court erred in its finding numbered 16; and which finding reads as follows:

"16. The defendant in the incubator known as Plaintiff's Exs. 12 to 12KK and Defendant's Ex. F sets eggs in various stages of incubation".

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XVII.

The Court erred in its finding numbered 17; and which finding reads as follows:

"17. Claims 1 and 2 of the Smith patent require the circulation of air through the eggs in current form by mechanical means such as fans or their equivalents, but the direction of the current is not essential".

XVIII.

The Court erred in its finding numbered 18; and which finding reads as follows:

"18. The defendant, in the incubators identified in Finding 16 hereof, circulates the air through the eggs in current form by mechanical means such as fans or their equivalents."

XIX.

The Court erred in its finding numbered 19; and which finding reads as follows:

"19. The Smith patent shows and describes a process in which the air moves in current form in repeated cycles over the eggs so that moisture is conserved, and the temperature is maintained substantially the same throughout the chamber by the carrying of the heat units from eggs in later stages of incubation to eggs in earlier stages of incubation."

XX.

The Court erred in its finding numbered 20; and which finding reads as follows:

"20. The Snow machines, identified in Finding 16 hereof, use a process in which the air moves and functions in the manner described in finding 19 hereof."

XXI.

The Court erred in its finding numbered 21; and which finding reads as follows:

"21. Claim 1 is not limited in terms or by the proceedings in the Patent Office to the use of details of the apparatus such as the curtains, nor to the particular size, speed, location or arrangement of the fans shown in the patent".

XXII.

The Court erred in its finding numbered 22; and which finding reads as follows:

"22. Claim 1 is of sufficient breadth to cover a process in which the current movement of the air in defined paths is secured by mechanical means such as fans."

990 XXIII.

The Court erred in its finding numbered 23; and which finding reads as follows:

"23. The defendant, in the machines identified in Finding 16 hereof, employs a process in which the current movement of the air in defined paths is secured by mechanical means such as fans."

XXIV.

The Court erred in its finding numbered 24; and which finding reads as follows:

"24. The defendant, in the incubators identified in Finding 16 hereof, has infringed upon claim 1 of the patent".

XXV.

The Court erred in its finding numbered 25; and which finding reads as follows:

"25. Claim 2 of the Smith Patent differs from claim 1 only in the inclusion of a 'power driven' current of air; and

in specifying that that current of air shall pass from an adjacent chamber through openings into the egg chamber".

XXVI.

The Court erred in its finding numbered 26; and which finding reads as follows:

"26. The Snow incubators as specified in Finding 16 hereof use a 'power driven' current and that current is created in the chamber at the rear of the egg racks and passes through openings provided therefor around the egg racks and thence enters the egg racks."

XXVII.

The Court erred in its finding numbered 27; and which finding reads as follows:

"27. The Snow incubators as specified in Finding 16 hereof infringe upon claim 2 of the Smith patent."

XXVIII.

The Court erred in its finding numbered 28; and which finding reads as follows:

"28. That a decree shall be entered finding the patent in suit unanticipated and valid and claims 1 and 2 thereof infringed; an injuncton shall be issued forbidding the continued use by the defendant of the machines similar to those identified in Finding 16 hereof, or of any machines embodying the invention of the patent in suit and either claims 1 or 2 thereof; and the defendant shall be required to account for all gains and profits which he shall have made by the use of those machines or any machines embodying the Smith invention."

991

XXIX.

The Court erred by not making, in its decision, the following finding, to-wit:

"1. That prior patents and publications disclose the fact that stage incubation was old and public property before Smith entered the field."

XXX.

The Court erred by not making, in its decision, the following finding, to-wit:

"2. The Smith prior public usage, at Cleveland, Ohio, during the years 1913 and 1914, was a commercial usage,

which barred the plaintiff from securing a valid claim in his patent 1,262,860, to cover the method of air circulation there used at that time."

XXXI.

The Court erred by not making, in its decision, the following finding, to-wit:

"3. The method of air circulation publicly used by Dr. Smith, at Cleveland, Ohio, during the years 1913 and 1914, was the same as the method of air circulation in the present Smith commercial machine with the curtains removed."

XXXII.

The Court erred by not making, in its decision, the following finding, to-wit:

"4. The Smith public commercial usage, at Cleveland, Ohio, during the years 1913 and 1914, bars the plaintiff from asserting that increasing the volume and velocity of air travel in an incubator beyond the volume and velocity of the air travel in the Smith commercial machine, is the mechanical equivalent of curtains, disclosed in the Smith patent."

XXXIII.

The Court erred by not making, in its decision, the following finding, to-wit:

"5. The Smith prior public usage, at Cleveland, Ohio, during the years 1913 and 1914, bars an interpretation of claim 1 of the Smith patent in suit to cover every process in which the current movement of the air in defined paths is secured by mechanical means, such as fans."

XXXIV.

The Court erred by not making, in its decision, the following finding, to-wit:

"6. The methods, defined in the relied on claims 1 and 2 of the Smith patent in suit, cannot be carried out in a machine wherein the air current is not confined by use of curtains or equivalent partitions".

992 XXXV.

The Court erred by not making, in its decision, the following finding, to-wit:

"7. In view of the file wrapper estoppels, imposed upon the Smith patent in suit, and the prior uses, patents and pub-

lications, claims 1 and 2 of the Smith patent are not open to a broad interpretation to cover any hatching process, including merely stage incubation and forced draft air circulation".

XXXVI.

The Court erred in not making, in its decision, the following finding, to-wit:

"8. The defendant does not utilize a hatching method including applying a current of air to move in a column through the corridor of this machine, or applying a current of air to move in columns through his egg trays."

XXXVII.

The Court erred by not making, in its decision, the following finding, to-wit:

"9. The relied on claims 1 and 2 of the Smith patent in suit are restricted to cover a method of hatching, which, among other things, consists in applying a current of heated air to move in columns through egg trays."

XXXVIII.

The Court erred by not making, in its decision, the following finding, to-wit:

"10. The relied on claims 1 and 2 of the Smith patent in suit are restricted to cover only a method of hatching, which, among other things, consists in applying a current of heated air and confining the movement of said current to a columnar movement by use of curtains or equivalent partitions".

XXXIX.

The Court erred by not making, in its decision, the following finding, to-wit:

"11. The relied on claims 1 and 2 of the Smith patent in suit are limited to a particular hatching method, which among other things, consists in applying a current of heated air created by means other than variations of temperature and moving the said current from said current creating means, first, to eggs in the more advanced stage of incubation, and thence, to eggs in the less advanced stage of incubation."

XL.

The Court erred by not making in its decision, the following finding, to-wit:

993 "12. In the defendant's hatching method, the hot air is not moved by the air forcing means, first to the eggs in the more advanced stage of incubation, and thence to the eggs in the less advanced stage of incubation, within the meaning of the relied on claims 1 and 2 of the Smith patent."

XLI.

The Court erred by not making, in its decision, the following finding, to-wit:

"13. The defendant does not utilize a hatching method, including applying a current of heated air within the meaning of claims 1 and 2 of the Smith patent in suit."

XLII.

The Court erred by not making, in its decision, the following finding, to-wit:

"14. Defendant does not apply a current of heated air within the meaning of the claims in suit, but, on the contrary, employs a general agitation, churning or diffusion of the enclosed air, without creating any general current or defined path of travel."

XLIII.

The Court erred by not making, in its decision, the following finding, to-wit:

"15. Claim 2 of the Smith patent in suit is limited to a current of air that passes from an adjacent chamber through openings into the egg chamber. Defendant does not have an 'adjacent chamber' within the meaning of the claim, and, therefore, does not infringe the claim."

XLIV.

The Court erred by not making, in its decision, the following finding, to-wit:

"16. The relied upon claims 1 and 2 of the Smith patent, 1,262,860, must be so narrowly construed, if held valid over the prior act, including Smith's prior commercial usage, and the file wrapper record of the patent, that they do not cover the defendant's method of hatching eggs."

XLV.

The Court erred by not making, in its decision, the following finding, to-wit:

"17. The defendant has not infringed either claim 1 or claim 2 of the Smith patent, 1,262,860."

XLVI.

The Court erred by not making, in its decision, the following finding, to-wit:

994 "18. Claim 1 and claim 2 of the Smith patent, 1,262,860, are invalid for lack of invention and want of novelty in view of the prior art."

XLVII.

The Court erred by not making, in its decision, the following finding, to-wit:—

"19. That a decree shall be entered dismissing the complainant's bill of complaint and assessing the defendant's costs against the complainant."

Note—The findings forming the basis for the foregoing assignments of errors, numbered XXIX to XLVII, inclusive, were suggested to the Court on behalf of the defendants in the Appendices of defendants' printed briefs in accordance with the Court's request made near the close of the trial and appearing on page 801 of the typewritten record.

XLVIII.

The Court erred by not making, in its decision, a finding to the effect that the file wrapper record of the Samuel B. Smith patent, 1,262,860, of April 16, 1918, in suit, conclusively shows that said Samuel B. Smith repeatedly presented in his said application for said patent successive sets of broad claims, some of which, if allowed, would have covered and included any method of hatching eggs, wherein the two steps of staged incubation and forced draft were employed, and further shows that all such claims, calling broadly for those two steps of staged incubation and forced draft, were rejected by the Commissioner of Patents, on references cited, and further shows that thereafter the said rejected claims were eliminated by the said applicant, Samuel B. Smith, and also shows that the said applicant later presented other method claims of much narrower scope than the eliminated claims, and two of which last referred to narrower claims matured into the relied upon claims 1 and 2 of the said Samuel B. Smith patent here in suit.

XLIX.

The Court erred by not making, in its decision, a finding to the effect that, because of the said conduct of said
995 Samuel B. Smith in the prosecution of his application, which matured into his said patent, 1,-

262,860, here in suit, identified in the foregoing assignment of error, numbered XLVIII, the said Samuel B. Smith, his heirs, legal representatives and assigns, were and are estopped from receiving any interpretation of the relied upon claims 1 and 2 of his said patent here in suit broad enough to cover and include any method of hatching eggs, wherein there is combined simply the two steps of staged incubation and forced draft.

L.

The Court erred by not making, in its decision, a finding to the effect that if the relied upon claims 1 and 2 of the Smith patent, 1,262,860, of April 16, 1918, in suit, are to be held valid, they must be so construed as to differentiate from the estoppels arising from the file wrapper record of the said Smith patent, in suit, referred to in the foregoing assignments of errors numbered XLVIII and XLIX and must also be so construed as to differentiate from the prior art, including the method of hatching eggs proven to have been employed by said Samuel B. Smith, at Cleveland, Ohio, throughout the years 1913 and 1914, at dates over two years before he filed his application for his patent here in suit.

LI.

The Court erred in not making, in its decision, a finding to the effect that, when said relied upon claims 1 and 2 of the Smith patent 1,262,860, of April 16, 1918, are construed, as stated to be required in the foregoing assignment of error numbered L, they cannot be held to cover and include the defendants' method of hatching eggs.

LII.

The Court erred in not making, in its decision, a finding to the effect that said relied upon claims 1 and 2 of the Samuel B. Smith patent 1,262,860, of April 16, 1918, in suit, must be construed to have the limited meanings and limited scope accorded thereto in the prior adjudication of this same Smith patent by the trial court and the Cir-
996 cuit Court of Appeals for the Sixth Circuit in what is known on this record as the "Petersime Case", and the full title of which case is "Buckeye Incubator Co. et al vs. R. M. Petersime", decided by the trial court, Judge Hickenlooper, in an oral decision dated June 30, 1926, and a typewritten memorandum of which was approved by said Judge September 17, 1926, (unreported) and which decision was affirmed by the said Circuit Court of Appeals for the Sixth Circuit in a decision rendered June 10, 1927, and re-

ported in 19 F. R. (2nd) 721; and in which case the plaintiff's bill of complaint was dismissed for non-infringement.

LIII.

The Court erred in not giving to said relied upon claims 1 and 2 of the Samuel B. Smith patent, 1,262,860, of April 16, 1918, in suit, the same limited meanings as was accorded thereto by the said trial court and the said Circuit Court of Appeals for the Sixth Circuit in the said Petersime Case, identified in the foregoing assignment of error numbered LII.

LIV.

The Court erred in not making, in its decision, a finding to the effect that said relied upon claims 1 and 2 of the Samuel B. Smith patent, 1,262,860, of April 16, 1918, in suit, must be construed to have the limited meanings and the limited scope accorded thereto in the prior adjudication of this same Smith patent by the trial court and the Circuit Court of Appeals for the Sixth Circuit in the case known on this record as the "Blum Case", and the full title of which is "Buckeye Incubator Co. et al vs. Blum," wherein the trial court's decision was rendered of date February 14, 1927, and was reported in 17 F. R. (2nd) 456, and wherein the decision of the Circuit Court of Appeals for the Sixth Circuit, affirming the trial court, was rendered July 6, 1928, and was reported in 27 F. R. (2nd) 333; and in which case the plaintiff's bill of complaint was dismissed for non-infringement.

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LV.

The Court erred in not giving to said relied upon claims 1 and 2 of the Samuel B. Smith patent, 1,262,860, of April 16, 1918, in suit, the same limited meanings as were accorded thereto by the said trial court and the said Circuit Court of Appeals for the Sixth Circuit in the said Blum Case, identified in the foregoing assignment of error numbered LIV.

LVI.

The Court erred in not making, in its decision, a finding to the effect that said relied upon claims 1 and 2 of the Samuel B. Smith patent, 1,262,860, of April 16, 1918, in suit, must be construed to have the limited meanings and limited scope accorded thereto in the prior adjudication of this same Smith patent by the trial court and the Circuit Court of Appeals for the Third Circuit, in the case known on this record as the "Hillpot Case", and the full title of which is

"Buckeye Incubator Co. et al vs. Hillpot", in the trial court, wherein the decision was rendered August 4, 1927, and is reported in 22 F. R. (2d) 855, and the full title of which in the Circuit Court of Appeals was "Buckeye Incubator Co. et al vs. Hillpot" and "Hillpot vs. Buckeye Incubator Co. et al", wherein the decision was rendered February 10, 1928, and was reported in 24 F. R. (2nd) 341; and in which case the plaintiff's bill of complaint was dismissed for non-infringement.

LVII.

The Court erred in not giving to said relied upon claims 1 and 2 of the Samuel B. Smith patent, 1,262,860, of April 16, 1918, in suit, the same limited meanings as were accorded thereto by the said trial court and the said Circuit Court of Appeals for the Third Circuit, in the said Hillpot Case, more fully identified in the foregoing assignment of error LVI.

LVIII.

The Court erred in that it did not grant the relief prayed for in the answer of the defendants.

998 Wherefore, the defendants-appellants pray that said Decree be reversed and that said District Court, for the District of Minnesota, Fourth Division, be ordered to enter a decree reversing the decision of the lower court in said cause.

Dated at Minneapolis, Minnesota, this 18 day of February, 1933.

E. H. SNOW AND E. H. SNOW, d. b. a.
SNOW'S HATCHERIES AND
SNOW'S INCUBATOR COMPANY,
Defendants-Appellants.

By their Attorneys,
WILLIAMSON & WILLIAMSON,
925 Metropolitan Life Building,
Minneapolis, Minnesota.

Service of the above Assignments of Errors and receipt of a copy thereof is hereby admitted this 18th day of February, 1933.

PAUL, PAUL & MOORE,
Attorneys for Plaintiff-Appellee.

(Endorsed): Filed Feb. 18-1933, Joel M. Dickey, Clerk, By Thomas H. Howard, Deputy.

999 Citation on Appeal.

In the United States District Court, District of Minnesota, Fourth Division.

Samuel B. Smith, Plaintiff,
No. 2119. vs. Equity.
E. H. Snow and E. H. Snow, d. b. a. Snow's Hatcheries and Snow's Incubator Company, Defendant.

By the Honorable Joseph W. Molyneaux, one of the Judges of the United States District Court for the District of Minnesota, Fourth Division.

To The Plaintiff and Appellee, Samuel B. Smith, care of his Attorneys of record, Messrs. Paul, Paul & Moore, 700 Security Building, Minneapolis, Minnesota—Greeting:—

Within forty (40) days from the date hereof, you are hereby cited and admonished to be and appear in the United States Circuit Court of Appeals for the Eighth Circuit, at St. Louis, Missouri, pursuant to an order of the above Court, allowing an appeal, filed and entered in the Clerk's office of the District Court of the United States for the District of Minnesota, on February 16, 1933, from an Interlocutory Decree, signed, filed and entered on the 11th day of February, 1933, in that certain Equity Suit No. 2119, wherein you are plaintiff and appellee, and E. H. Snow, and E. H. Snow, d. b. a. Snow's Hatcheries and Snow's Incubator Company, are the defendants, appellants, to show cause, if any there be, why the said Decree, rendered against the said appellants, should not be corrected and reversed, and why speedy justice should not be done to the parties in that behalf.

Witness the Honorable Joseph W. Molyneaux, United States District Judge for U. S. District of Minnesota, Fourth Division, this 21st day of February, 1933, and of the One Hundred and Fifty-Seventh year of the Independence of the United States.

JOSEPH W. MOLYNEAUX,
U. S. District Judge for the District of Minnesota.

Service of the above Citation and receipt of copy thereof, is hereby admitted and acknowledged this 21st day of February, 1933.

SAMUEL B. SMITH,
By Paul, Paul & Moore,
His Attorneys of Record.

Endorsed: Filed in U. S. District Court on Feb. 21, 1933.

1001 (Stipulation for Extension of Time to File Transcript and Order Granting Same.)

Stipulation.

It Is Hereby Stipulated and Agreed, by and between the counsel for the respective parties hereto, that the time for return under the Citation and for docketing the appeal herein be enlarged and extended to and including the 1st day of May, 1933, and that an order to that effect may be entered herein without further notice.

Signed at Minneapolis, Minnesota this 16th day of March, 1933.

PAUL, PAUL & MOORE,
Counsel for Plaintiff-Appellee.

WILLIAMSON & WILLIAMSON,
Counsel for Defendant-Appellant.

Order.

The foregoing stipulation is hereby approved, and it is hereby

Ordered, that the time for the return, under the Citation, and for docketing the appeal herein, shall be and is hereby enlarged and extended to and including the 1st day of May, 1933.

Dated this 16th day of March, 1933.

JOSEPH W. MOLYNEAUX,
U. S. District Judge.

(Endorsed): Filed Mar. 16, 1933, Joel M. Dickey, Clerk, By Thomas H. Howard, Deputy.

1002 (Stipulation for Further Extension of Time to File Transcript and Order Granting Same.)

It Is Hereby Stipulated And Agreed, by and between the counsel for the respective parties hereto, that the time for return under the Citation and for docketing the appeal herein be enlarged and extended to and including the 1st day of June, 1933, and that an order to that effect may be entered herein without further notice.

Signed at Minneapolis, Minnesota, this 10th day of April, 1933.

WILLIAMSON & WILLIAMSON,
Attorneys for Defendant-Appellant.

Signed at Chicago, Ill., this 12th day of April, 1933.

A. L. ELY,
Attorney for Plaintiff-Appellee.

Order.

The foregoing Stipulation is hereby approved, and it is hereby

Ordered, that the time for return, under the Citation, and for docketing the appeal herein, shall be and is hereby enlarged and extended to and including the 1st day of June, 1933.

JOSEPH W. MOLYNEAUX,
U. S. District Judge.

Dated this 20th day of April, 1933.

(Endorsed): Filed Apl. 20, 1933, Joel M. Dickey, Clerk, By Thomas H. Howard, Deputy.

1003 Stipulated Praecipe for Transcript.

To the Clerk of the Court:

It Is Hereby Stipulated, That the hereinbelow identified portions of the record before the trial court shall be included in the typewritten transcript on appeal:

1. The Plaintiff's Bill of Complaint.
2. The Plaintiff's Bill of Particulars.
3. The Defendants' Answer.
4. The Trial Court's Order of November 5, 1932.

5. The Defendants' Response to the said Order of November 5, 1932. Which Order was filed November 7, 1932.

6. Stipulation for the usage of copies of patents and photostats of publications and as to the title to the Smith patent in suit.

7. The testimony of the hereinbelow named witnesses, part thereof in narrative form and part thereof in full, identified by page references to the typewritten trial record and arranged in the order taken, to-wit:

Plaintiff's Prima Facie Case.

Joseph I. Taggart, pp. 3-148, inclusive, part thereof in narrative form and part thereof in full.

Harry B. Perkins, pp. 149-163, inclusive, in narrative form.

Earl H. Snow, pp. 164-165, inclusive, in narrative form.

Joseph I. Taggart (recall) pp. 165-168, inclusive. part thereof in narrative form and part thereof in full.

Defendant's Case.

Samuel B. Smith, the plaintiff, examined as the adverse party, pp. 169-186, inclusive, in narrative form.

E. H. Snow, the defendant, pp. 186-287, inclusive, part thereof in narrative form and part thereof in full.

Nora Snow, pp. 288-289, inclusive, in narrative form.

Professor Frank B. Rowley, pp. 290-616, inclusive, part thereof in narrative form and part thereof in full.

Plaintiff's Rebuttal Case.

Lena Laux, pp. 617-643, inclusive, in full.

Clarence J. Holmes, pp. 644-648, inclusive, in narrative form.

1004 Malcolm G. Reynolds, pp. 649-653, inclusive in narrative form.

Harold E. Davis, pp. 654-662, inclusive, in narrative form.

Joseph I. Taggart, pp. 663-690, inclusive, and page 691, down to expression "Plaintiff rests", part thereof in narrative form and part thereof in full.

Defendants' Surrebuttal Case.

Nora Snow, pp. 693 to line 5 from bottom on p. 708, in full.

8. Plaintiff's Exhibits, to-wit:

1. Copy of Smith Patent in suit No. 1,262,860, of April 16, 1918. (Introduced on page A-28, at end of Mr. Ely's opening statement).

2. Chart entitled "Days of Incubation". (Introduced on page 29).

3. Chart entitled "Record of Heat Development in Eggs of the Common Fowl. (Introduced on page 29).

4. Photograph attached to Exhibit 3. (Introduced on page 30).

5. Taggart's pencil sketch. (Introduced on page 30).

6. Photo 1475—Angle view Plaintiff's Smith Commercial machine. (Introduced on page 38).

6A. Photo 1476—Front view Plaintiff's Smith Commercial machine. (Introduced on page 38).

6B. Photo 1477—Plaintiff's Smith Commercial machine with front removed—curtains being drawn back. (Introduced on page 38).

6C. Photo 1478—Plaintiff's Smith Commercial machine with side removed and curtains removed. (Introduced on page 38).

7, 7A and 7B. Scale drawings of Plaintiff's Smith Commercial machine. (Introduced on page 47).

8, 8A and 8B. 3 Sheets Snow advertisements. (Introduced on page 59).

9. Contract for purchase of Snow machine. (Introduced on page 60).

10. Photo 1472—Front View of Snow Model. (Introduced on page 75).

10A. Photo 1471—Angle view same machine. (Introduced on page 75).

10B. Photo 1473—Snow model—front removed. (Introduced on page 75).

10C. Photo 1474—Side of Corridor Snow Model. (Introduced on page 76).

10D. Photo 1460—Side of Snow Model with trays removed. (Introduced on page 76).

10E. Photo 1458—Detailed view hatching rack, Snow model. (Introduced on page 76).

1005 11. Catalogue of the Robbins Incubator Co. (Introduced on page 78).

12. Taggart's main or cross sectional test data sheet of plaintiff's model of Snow machine. (Introduced on page 89).

12AA. Taggart's Test data sheet taken on line A-A of Exhibit 12. (Introduced on page 89).

12BB. Taggart's Test data sheet taken on line B-B of Exhibit 12. (Introduced on page 89).

12CC. Taggart's Test data sheet taken on line C-C of Exhibit 12. (Introduced on page 89).

12DD. Taggart's Test data sheet taken on line D-D of Exhibit 12. (Introduced on page 89).

12EE. Taggart's Test data sheet taken on line E-E of Exhibit 12. (Introduced on page 89).

12FF. Taggart's Test data sheet taken on line F-F of Exhibit 12. (Introduced on page 89).

12GG. Taggart's Test data sheet taken on line G-G of Exhibit 12. (Introduced on page 89).

12HH. Taggart's Test data sheet taken on line H-H of Exhibit 12. (Introduced on page 89).

12JJ. Taggart's Test data sheet taken on line J-J of Exhibit 12. (Introduced on page 89).

12KK. Taggart's Test data sheet taken on line K-K of Exhibit 12. (Introduced on page 89).

13. Taggart's colored main or cross section test data sheet of plaintiff's model of Snow machine. (Introduced on page 92).

13BB. Taggart's colored test data sheet taken on line B-B of Exhibit 13. (Introduced on page 92).

13CC. Taggart's colored test data sheet taken on line C-C of Exhibit 13. (Introduced on page 92).

13DD. Taggart's colored test data sheet taken on line D-D of Exhibit 13. (Introduced on page 92).

13FF. Taggart's colored test data sheet taken on line F-F of Exhibit 13. (Introduced on page 92).

13GG. Taggart's colored test data sheet taken on line G-G of Exhibit 13. (Introduced on page 92).

13HH. Taggart's colored test data sheet taken on line H-H of Exhibit 13. (Introduced on page 92).

13JJ. Taggart's colored test data sheet taken on line J-J of Exhibit 13. (Introduced on page 92).

13KK. Taggart's colored test data sheet taken on line K-K of Exhibit 13. (Introduced on page 92).

1006 15. Taggart's scale drawing of Snow's Sleepy Eye machine. (Introduced on page 102).

18. Original contract for purchase by Snow of his second Smith incubator. (Introduced on page 158).

19. Tabulated list of incubators sold by Smith Incubator Co. and Buckeye Incubator Co. (Introduced on page 160).

20. Snow's letter to Smith Incubator Co. of October 30/24. (Introduced on page 165).

21. Copy of letter from Smith Incubator Co. to Snow of November 4, 1924. (Introduced on pages 166 and 167).

22. Rowley's test data sheet colored by Taggart—Sheet taken on section line B-B. (Introduced on page 592).

23. Rowley's test data sheet colored by Taggart—Sheet taken on section line D-D. (Introduced on page 592).

14. Respecting this Exhibit 14, Taggart's colored celluloid test model.

It is hereby stipulated that this may be sent up as a physical exhibit.

9. Defendants' Exhibits, to-wit:—

A. Photostat of page 5 of the Cleveland Sunday Plain Dealer of January 23, 1913. (Introduced on page 180).

B. Photostat of page 5 of the Cleveland Leader of Sunday, February 22, 1914. (Introduced on page 181).

C. Snow's egg setting sketch. (Introduced on page 194).

D-1. Photo of Snow's electrically heated incubator exhibited at Flour Exchange showing the interior looking through the doorway, one of the water pans being removed. (Introduced on page 199).

D-2. Photo of same machine similarly taken but showing both water pans in place. (Introduced on page 199).

D-3. Photo of interior of same machine with some trays removed showing one of the agitators. (Introduced on page 199).

D-4. Photo of same machine showing the exterior thereof in perspective. (Introduced on page 199).

D-5. Photo of same machine showing the exterior thereof chiefly in front elevation. (Introduced on page 199).

1007 E-1. Photo showing interior of Snow steam heated Sleepy Eye machine looking through the door. (Introduced on page 201).

E-2. Photo showing similar view with Mr. Snow in corridor. (Introduced on page 201).

E-3. Photo showing the same machine in exterior perspective. (Introduced on page 201).

G-1. Photo showing name plate on door of Snow's Smith machine at Flour Exchange. (Introduced on page 212).

G-2. Photo showing interior of same Snow's Smith machine looking through the doorway. (Introduced on page 212).

G-3. Photo similar to exhibit G-2 with one fan panel dropped. (Introduced on page 212).

J-1. Rowley's test diagram Smith machine—Sheet 1. (Introduced on pages 315 and 316).

J-2. Rowley's test diagram Smith machine—Sheet 2. (Introduced on pages 315 and 316).

L-1. Scale drawing Snow Incubator—front elevation. (Introduced on page 319).

L-2. Scale drawing Snow Incubator—side elevation. (Introduced on page 319).

L-3. Scale drawing Snow Incubator—longitudinal section on line 3-3 of Exhibit L-1 with some parts removed. (Introduced on page 319).

L-4. Scale drawing Snow Incubator—cross section on line 4-4 of Exhibit L-2. (Introduced on page 319).

L-5. Scale drawing Snow Incubator—details. (Introduced on page 319).

M-1. Rowley's test data—test diagram No. 1—vertical transverse section through Snow machine at Flour Exchange (Introduced on page 350).

M-2. Rowley's test data—test diagram No. 2—Sheet No. 1, data taken on line A-A of diagram No. 1, (Exhibit M-1). (Introduced on page 350).

M-3. Rowley's test data—test diagram No. 2—Sheet No. 2, data taken longitudinally of corridor looking to left of diagram No. 1 (Exhibit M-1). (Introduced on page 350).

M-4. Rowley's test data—test diagram No. 2—Sheet No. 3, data taken on line B-B test diagram No. 1 (Exhibit M-1). (Introduced on page 350).

M-5. Rowley's test data—test diagram No. 3—Sheet No. 1, data taken on line C-C of diagram No. 1 (Exhibit M-1). (Introduced on page 350).

M-6. Rowley's test data—test diagram No. 3, Sheet No. 2, data taken on line D-D test diagram No. 1 (Exhibit M-1). (Introduced on page 350).

1008 M-7. Rowley's test data—test diagram No. 4—sheet No. 1—horizontal section through Snow machine at Flour Exchange. (Introduced on page 350).

N-1. Rowley's test data sheet No. 1, Snow's Sleepy Eye machine. (Introduced on pages 352 to 355).

N-2. Rowley's test data sheet No. 2, Snow's Sleepy Eye machine. (Introduced on pages 352 to 355).

N-3. Rowley's test data sheet No. 3, Snow's Sleepy Eye machine. (Introduced on pages 352-355).

O. Certified copy of the file wrapper record of the Smith patent in suit, 1,262,860, of April 16, 1918. (Introduced on page 406).

It is hereby stipulated that this Exhibit O may be regarded as a physical exhibit and transmitted with the other physical exhibits to the Circuit Court of Appeals.

P. Portfolio of prior patents relied upon by defendants which prior patents are specifically identified as follows:—(classified into two groups)

Group A.

Prior Patents Cited on the File Wrapper Record of the Smith Patent in Suit, 1,262,860, of April 16, 1918.

U. S. No. 120,253, Oct. 24, 1871, H. Endemann, "Improvement in Apparatus for Drying Fruits, Meat, Etc."

U. S. No. 152,644, June 30, 1874, E. A. Jones and C. W. Jones, "Fruit Driers".

U. S. No. 272,744, Feb. 20, 1883, A. H. Morgan, "Incubator".

U. S. No. 286,756, Oct. 16, 1883, C. F. Winkler, "Incubator".

U. S. No. 297,676, Apr. 29, 1884, G. Conant, "Device for Preserving Eggs".

U. S. No. 330,457, Nov. 17, 1885, C. Bassini, et al, "Incubator".

U. S. No. 344,474, June 29, 1886, J. W. Campbell, "Heat Regulating Attachment for Incubators".

U. S. No. 559,676, May 5, 1896, T. R. C. Christianson, "Storing Eggs and Apparatus for Turning Them to Keep Them Fresh".

U. S. No. 591,870, Oct. 19, 1897, F. H. Morgan, "Incubator".

U. S. No. 691,837, Jan. 28, 1902, V. S. Bell, "Incubator".

U. S. No. 709,650, Sept. 23, 1902, O. P. Scott, "Incubator".

U. S. No. 745,458, Dec. 1, 1903, [illegible]. C. Perkins, "Electrical Incubator".

U. S. No. 828,181, Aug. 7, 1906, G. H. Boyd, "Incubator".

U. S. No. 891,019, June 16, 1908, L. Verna, "Drying Room".

U. S. No. 916,454, Mar. 30, 1909, V. C. Koons, "Incubator".

U. S. No. 949,653, Feb. 15, 1910, J. H. Klinke, "Incubator".

U. S. No. 1,100,146, June 16, 1914, J. O. Olson, "Incubator".

U. S. No. 1,137,752, May 4, 1915, G. E. Goldstein, "Apparatus for Curing or Artificially Ageing Cigars".

U. S. No. 1,160,793, Nov. 16, 1915, S. S. VanKeuren, "Incubator".

German Patent No. 155,917, Nov. 7, 1901. E. Stulik, "Incubating Process and Device for Group Charging and Simultaneous Treatment of the Groups of Eggs Inserted at Different Times into the Incubating Apparatus".

Certified English Translation of said German Patent to Stulik, 155,917, of Nov. 7, 1901. (Introduced page 416).

1009 Group B.

Prior Patents Set Up in Answer but not Cited on File Wrapper Record of the Smith Patent, 1,262,860, of April 16, 1918, in Suit.

U. S. No. 3,019, Mar. 30, 1843, N. E. Guerin, "Egg Hatching Apparatus".

U. S. No. 360,223, Mar. 29, 1887, E. H. Johnson, "Electrical Apparatus for Heating and Cooling Buildings".

U. S. No. 426,321, Apr. 22, 1890, J. K. Proctor & J. H. Knowles, "Drying Machine".

U. S. No. 843,909, Feb. 12, 1907, F. M. Peters & H. H. Hungerford, "Atmosphere Regulating System".

U. S. No. 992,622, May 16, 1911, J. Wiebe, "Egg Drier".

U. S. No. 1,010,809, Dec. 5, 1911, J. Schmidt & H. Schütterle, "Apparatus for Drying Macaroni and Like Bakery Products".

U. S. No. 1,075,747, Oct. 14, 1913, C. W. Zimmer, "Semi-fireless Incubator".

Q. Photostats of two pages of Ure's Dictionary of Arts, Manufactures and Mines Published by Longmans, Green & Co., London England, in 1867, (one photostat being of the title page of said book and the other being of the article entitled "Incubation Artificial", appearing on pp. 652 and 653 of Vol. II. of that publication). (Introduced on page 415).

R. Photostat of pages 2704 and 2705, Vol. III. of Knight's American Mechanical Dictionary, published by Houghton, Mifflin & Company, in Boston, Massachusetts, in 1884, including an article entitled "Ventilator", appearing on said pages of said book. (Introduced on page 425).

S. Rowley's Sketch of one compartment of Smith's 1913 and 1914 incubating machine, testified to by said Smith. (Introduced on page 482).

T. Schwartz patent, 535,175, of March 5, 1895. (Introduced on page 614).

U. Drawing entitled "Incubator of E. H. Snow, Sleepy Eye, Minn." taken from the transcript of the Boling case

and illustrating one of the Boling machines. (Introduced page 615).

V. Petersime patent, 1,562,787, of Nov. 24, 1925, illustrating the structure of the Petersime machine involved in the Petersime case. (Introduced on page 616).

10. Stipulation as to Certain Large Sized Machine Exhibits of the Respective Parties.

In respect to the plaintiff's machine exhibits, numbered 16 and 17, respectively, introduced on page 142 of the typewritten record, said exhibit 16 was a full sized working specimen of plaintiff's Smith Incubator, and said exhibit 17 was a full sized working specimen of the plaintiff's model or alleged reproduction of the defendants' steam heated machine; and respecting the defendants' Exhibit F, introduced
1010 on page 203 of the typewritten record, the same was a full sized working specimen of the defendant, Snow's electrically heated incubator; and respecting defendant's Exhibit H, introduced on page 213 of the typewritten record, the same was a full sized working specimen of the defendant, Snow's Smith machine.

All of the said four machine exhibits, above identified, are of such large size that they could not be set up and operated in the courtroom of the Circuit Court of Appeals for the Eighth Circuit, each and all of said machines being about 14 feet long by 11 or 12 feet wide, and about 8 feet high. In view of these facts,

It Is Hereby Stipulated, that none of said four machine exhibits above identified, need to be certified up to the Circuit Court of Appeals by the Clerk of the trial court, but it is hereby further stipulated that the respective parties to the suit, if they, or either thereof, should desire, may set up their said respective exhibit machines in the particular city wherein the said Circuit Court of Appeals will hear the appellants' appeal, and allow the Judges of said Court to inspect the said machines, in the presence of counsel for the respective parties, at or about the time when the hearing of the Appellant's appeal shall be had by the said Court.

11. The trial court, Joseph W. Molyneaux's Memorandum of Decision, dated February 7th, 1933.

12. The Interlocutory Decree, signed and filed by his Honor, Joseph W. Molyneaux, February 11th, 1933.

13. Petition for Appeal and Supersedeas Order, dated February 16th, 1933, and the Order of the trial court, Joseph

W. Molyneaux, allowing said appeal and supersedeas, signed and filed February 16th, 1933.

1011 14. Copy of the Defendants' Supersedeas Bond, executed February 20, 1933, and approved by the trial court, Joseph W. Molyneaux, and filed February 21, 1933.

15. Assignment of Errors, signed, served on plaintiff's counsel, and filed with the Clerk of Court, February 18, 1933.

16. Citation on Appeal, signed by the trial court, Judge Joseph W. Molyneaux, served on plaintiff's counsel and filed with the Clerk of Court, February 21st, 1933.

17. Stipulation and Order of the Court, dated March 16, 1933, enlarging and extending the time for the return under the Citation and for docketing the appeal in this case to and including the first day of May, 1933.

Signed at Minneapolis, Minnesota, this 18th day of March, 1933.

WILLIAMSON & WILLIAMSON,
Attorneys for Defendants-Appellants.

Signed at Akron, O., this 20th day of March, 1933.

A. L. ELY,
Attorney for Plaintiff-Appellee.

The foregoing Stipulated Praecipe for Transcript and all the Stipulations therein contained are hereby approved this 22nd day of March, 1933.

JOSEPH W. MOLYNEAUX,
District Judge.

(Endorsed): Filed Mar. 22, 1933, Joel M. Dickey, Clerk, By Thomas H. Howard, Deputy.

1012 (Stipulation that Certain Exhibits Be Sent to the Circuit Court of Appeals as Original Exhibits and Order Granting Same.)

Subject to the approval of the Court,

It Is Hereby Stipulated, That the plaintiff's exhibits, hereinbelow identified, called for in the Stipulated Praecipe for Transcript, may be sent up to the Circuit Court of Appeals as physical exhibits, to-wit:

Plaintiff's Exhibits 8, 8A and 8B, the same being three sheets of Snow's advertisements, and Plaintiff's Exhibit No. 11, Catalogue of the Robbins Incubator Co.

Signed at Minneapolis, Minnesota, this 10th day of April, 1933.

WILLIAMSON & WILLIAMSON,
Counsel for Defendant-Appellant.

Signed at Chicago, Ill., this 12th day of April, 1933.

A. L. ELY,
Counsel for Plaintiff-Appellee.

Order.

The foregoing Stipulation is hereby approved, and, it is hereby

Ordered, that the plaintiff's exhibits, identified in the foregoing Stipulation, may be sent up to the Circuit Court of Appeals as physical exhibits.

Dated this 20th day of April, 1933.

JOSEPH W. MOLYNEAUX,
U. S. District Judge.

(Endorsed): Filed Apl. 20, 1933, Joel M. Dickey, Clerk, By Thomas H. Howard, Deputy.

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26 (Approved Statement of Evidence.)

In the United States District Court, District of Minnesota, Fourth Division.

Samuel B. Smith, Plaintiff,
No. 2119. vs. Equity.
E. H. Snow and E. H. Snow, d. b. a. Snow's Hatcheries and Snow's Incubator Company, Defendant.

Before: His Honor, Joseph W. Molyneaux, District Judge,

September Term, 1932.

Minneapolis, Minnesota, November 16, 1932, 10:00 A. M.

Appearances:

Mr. Albert L. Ely, of Cleveland, Ohio, and Messrs. Paul, Paul & Moore, represented by Mr. Harold Olsen, on behalf of the plaintiff.

Messrs. Williamson & Williamson, represented by Messrs. James F. Williamson and Ralph E. Williamson, on behalf of the defendants.

At the close of Mr. Ely's opening statement, on behalf of the plaintiff, and before any witnesses were called, a copy of the Smith patent in suit, 1,262,860, of April 16, 1918, was offered and received into evidence and marked as "Plaintiff's Exhibit No. 1".

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27 Transcript of the Testimony of All Witnesses Examined.

Plaintiff's Prima Facie Case.

JOSEPH I. TAGGART'S Testimony Under Direct Examination.

Joseph I. Taggart, called as a witness on behalf of the plaintiff, being first duly sworn, testified to the following effect, his testimony being here reproduced, part of it in narrative form and part of it in full, to-wit:

He states that he is forty-five years old, resides at 1311 West 89th Street, Cleveland, Ohio, and that he is Assistant General Manager of the Smith Incubator Company, located at Cleveland, Ohio, being in direct charge of the erection and servicing of Smith Incubators, and research work, and also assists in the supervision of the manufacture of machines. Says that the said Smith Incubator Company manufactures incubators under the Smith patent. Says that he is a graduate of the Ohio Wesleyan University, where he specialized in zoology and graduated with high honors on that subject. Was also Assistant to the Professor for two years and gave a great deal of time to the study of embryology, using hen eggs, principally because of their uniformity and accessibility. Also studied the embryology of a lizard and prepared a thesis on that study.

Having been asked what had been his particular experience with regard to incubation and hatching since he left school, his answer was, in substance, as follows:

28 Says that he associated himself with Dr. Smith in 1923, first as a salesman and then was placed in charge of the Smith Standard Company, a name given to a large hatchery owned and operated by Dr. Smith in Cleveland. This hatchery had a million egg capacity. Then, for the next four years, was in charge of the flocks which produced the eggs for that hatchery, and also had charge of the

sales and supervision of that plant. Said plant did not operate throughout the entire calendar year, but only part of the year, and the rest of his time was devoted to work in connection with the Smith Incubator Company, the two companies occupying the same offices. He states that in this work it was his duty to make himself acquainted with all types of incubators in the country to study their methods of operation, contact the various universities to find out what they were doing with incubator problems, and to become generally informed on all the "subject of incubation". This work took him into all of the States of the Union, and most thereof he visited several times. In 1927, the Smith Standard Company was closed, or divided up into smaller units and sold, because the work of hatching chicks was interfering with the sale of incubators of the Smith Incubator Company, and since that time he has been associated entirely with the Smith Incubator Company.

29 The next question put to the witness, on page 5 of the typewritten record, read as follows:—

"Q. Now, Mr. Taggart, will you please just briefly describe the process of incubation, the hatching of an egg, just generally, as a foundation for what is coming."

The Witness' answer to this last above quoted question and to a large number of other questions, the last of which ends in the sixth line from the bottom of page 102 of the typewritten record, or in other words, his testimony in full from that point on page 5 to near the end of page 102 of the typewritten record, read as follows:—

"A. The egg, at the time it is laid, is full, that is, the shell is full. If the egg is fertile, the embryo has already started development, because the egg is generally fertilized twenty-four to thirty hours before it leaves the hen. In other words, when the egg drops from the ovary into the oviduct, it is just the yolk, or the yellow. The female
30 germ is a small spot on this yolk. As the egg passes down the oviduct, there are places where certain layers of albumen are deposited on the side of the yolk. There are three different layers of albumen, and on top,—or around this entire mass is a thin membrane, and a thin shell. This is the process of the yolk, of the albumen forming around the yolk; this is from twenty-four to thirty hours; that also includes the shell, or, from the time the yolk is dropped into the oviduct, to the time the egg is laid, is about twenty-four to thirty hours. This varies with individuals.

Now, the germ spot on the egg is fertilized almost immediately after dropping into the oviduct. The male germ is there waiting for it, and because of the temperature being right, germination starts right away, in a fertile egg, by the time it is laid, the chick is twenty-four to thirty-six hours on its way.

Now, after the egg is laid, normally it is chilled or cooled, and when cooled, germination stops, and if we hold the egg below a temperature of seventy degrees, the germination remains dormant, if it is held above seventy degrees, it progresses slowly, but to make it real active, it should be brought up in the neighborhood of body temperature,—of our body temperature, of around 99 to 100 degrees.

After it is placed in the incubator, this germination starts again in its normal way, and continues for twenty-one days, unless interrupted by death or some other means.

31 As the egg progresses, the white of the egg is used up as food. During the first seventeen days that the egg is in the incubator, it is living almost entirely for maintenance on the white of the egg. At the seventeenth day, most of it has been absorbed, and it begins to use the yellow or the yolk. Up to this time, the yolk has hung outside of the chick,—as a sack attached at the navel. By the twenty-first day, about half of this yolk has been absorbed as food. The other half has been drawn into the body of the chick, and at hatching time the chick has within it a yolk about half the size of the original yolk. That is still used as food, so that during the first forty-eight hours or fifty hours after hatching, a chick does not need to eat. It has its food and water with it in this form of the yolk.

Now, during its hatching period, or incubation period, the chick, or the embryo has been using up its food, and converted it into body tissues. It has also required oxygen and has given off carbon dioxid. This process of assimilating food and oxygen naturally produces heat.

Early in the stage, the embryo is so small that the heat produced is negligible, and, as incubation progresses, the chick becomes large enough so that it does develop a considerable quantity of heat.

Now, I have prepared a chart here that shows this heat development during the different days of incubation. There is one which is placed in front of Your Honor (indicat-
32 ing). The heavy curving line, or curve, represents the units of heat that are developed on the different

days of incubation. The days of incubation are recorded across the bottom of the graph. The figures on the right hand side of the graph give the units of heat in calories. These are known as the large calory, that represent one thousand of the food calories. To make it clearer, perhaps, one calory is equal to four British thermal units.

You will note, from this graph, that at the first four or five days there is no heat given off; in fact, the tests show that there is heat absorbed. From the fifth day on, there is an increasing amount of heat; you will note that on the seventeenth day the rising curve is interrupted for about twenty-four hours. That is the period when the chick is changing from the white of the egg as food over to yolk. The heat development appears to rest during that period, but after it goes on its new diet of the yolk the heat development rises rapidly, so that by the twenty-first day there are five calories of heat generated by each egg.

Now, I have also shown that heat development in another way. May I have that box, please (indicating):

(Box submitted to the witness.)

I have here a box, of which you have a picture of it there (indicating.) This box is heavily insulated. It is right underneath the next chart, attached to the next chart (indicating). In this box, I would place eggs, all at one
33 stage of incubation; for example, I would take an egg, or I would take a dozen eggs that were just ready to hatch. I will place this box first in the incubator, as it appears by the picture of the incubator. Then I would take this dozen eggs out of the hatching rack, and place them in this box, and put a lid on, and seal this box, so there would be no escape of air or heat from the box. And through the side of the box I would put a fever thermometer, or a clinical thermometer, so that the bulb would record the temperature that was within the box, so that I was able to read the temperature from the outside, as shown in the picture.

Now, with eggs that are twenty-one days old, when they go into the box, that is, when they first go in there they should be or they have been of the temperature of the incubator and, in this case, the temperature of the incubator was 99 degrees. Now, on the bottom, or next to the bottom column; the bottom row there (indicating), I have shown eggs that are twenty days and sixteen hours old when they went into the incubator.

Q. When they went into what?

A. When they went into the box. Thirty minutes later the fever thermometer showed a temperature of 101.8 degrees. Another reading was taken in thirty minutes, at which time the temperature was 102.4 degrees. These readings I continued at thirty minute intervals, up to five hours and a half, at which time the temperature within this
34 box was 110 degrees; in other words, showing that the dozen eggs which were then within the box had developed sufficient heat so that the temperature within the box was 110 degrees.

Now, at the same time, I took eggs that were twenty days and sixteen hours old, eggs that had already pipped,—the chicks had broken their shells, and they got ready to come out. And, in that connection, you will note that the heat development was more rapid, and that by the end of four hours we got a temperature within the box of 111 degrees, which was the top reading of the fever thermometer, and we could not record a higher temperature.

Now, going back up this scale (indicating), we find that by the time we started with eggs that were nine days and sixteen hours old, we were not able to develop any appreciable amount of heat; that thirty minutes after they were placed in the incubator we had a temperature there of 98.6; this gradually got back to 99, but did not get any higher.

Now, that is also true of the seven day and the five day eggs, but when we are in the twelve day eggs, we have got a temperature that rose in five and one-half hours to 101.8 degrees, which is almost three degrees higher than the temperature of the incubator at which the eggs were at the time that they were placed in this machine, or in this box.

This chart therefore is simply to show, in a simple test of this kind, that there is a very appreciable amount of heat developed among the eggs in the later stages of in-
35 cubation, but among those in the earlier stages, the quantity of heat is almost negligible.

Q. Mr. Taggart, at what time in the process approximately does the egg change over from this endothermic, that is, where the heat has to be applied to it, to the exothermic, where there is an excess heat,—that is, at what point?

A. It would be between the ninth and the twelfth day; midway is about as near as you can place it.

Q. That is, midway of the total period of time required for hatching?

A. Of the twenty-one days for hatching.

Q. Now, I believe you have not said anything in this discussion of yours about the evaporation of the water content; what are the requirements of that?

A. At the time the egg is first laid, I stated that the shell was full. As the egg is exposed to atmosphere, there is an evaporation of the moisture from within the egg to the outside, and from your own experience you have noticed the air cells of different size in the large end of the incubator.

Q. In the large end of the egg, you mean?

A. Yes, in the large end of the egg; these air cells increase by evaporation. A day or so after the egg is laid, it is about the size of a dime; and then, it depends on how the egg is kept, the air surrounding it, the dryness of it, and the access of air to it, as to how rapidly it evaporates.

Q. Now, in incubation, this evaporation is necessary,
36 but it must be controlled. If we allow the egg to evaporate twenty-five per cent by the time it is hatched, that is, by the time the egg hatches, we will have a small chick, a chick with short down, and it will be an inferior chick, decidedly inferior.

If we can control that evaporation, so that it does not lose over fifteen per cent,—so that the egg does not lose over fifteen per cent weight by evaporation, we can get a much better chick. This evaporation must be gradual; the evaporated moisture from the surface of the egg is continuallly cooling it. And, although there is a small amount of heat developed from the very beginning, this evaporation of water moisture offsets the heat development, and it is, perhaps, the tenth or eleventh day before the heat development within the chick, within the egg, is strong enough to overcome the cooling effect of this evaporating moisture.

37 Q. Were you familiar with the prior practical state of the incubation art before 1915, Mr. Taggart?

A. Yes, sir.

Q. Just briefly state what that was, will you please? Just briefly.

A. We have been hatching eggs by artificial incubation for two or three thousand years. In China, for example, for those of the Orient, they have been hatching them artificially as long as we know—have any records. The Egyptian incubators of two thousand years ago are a matter of history. During all the stage prior to the Smith invention the only incubators that had reached commercial use were small,—in this country at least, were small machines. The average incubator would hold about three hundred eggs. The eggs were placed in these machines on one level with the heating means

above and a means for the intake of fresh air at the bottom, so that the temperature above the egg was perhaps 103 and the temperature below the egg was perhaps 96. In this they were copying the hen. The body of a hen is above 103, as her normal temperature is 105 to 106, but the nest being on the ground is naturally cooler. All the early incubators operated on that principle, that you would have a different temperature above the eggs from what you would have below. It was necessary to turn the eggs frequently to keep them of a uniform temperature. This was done by the hen and is done by all the early incubators. It was customary to have one
38 thermostat for each cabinet and also a humidifying device and a ventilating system for each cabinet. Now as commercial incubation developed in this country they would connect up a number of these cabinets together, not unlike sectional bookcases. You might have one heating unit, but have as many as fifty or a hundred cabinets attached to that heating unit, by a system of pipes or radiators or they might heat each one with electricity, but each of the units were a separate incubator within themselves. There are some had reached as high as a thousand eggs in every machine, but that was not the general practice because they were not able to keep a uniform temperature throughout the entire machine. All these machines that are prior to this Smith invention were of a still air type. That is, there was no air circulation through there. They depended on convection current solely to distribute the air and the fresh air, being brought in at the bottom, would filter up through and would be let out at the top. Because of the way these machines were restricted, it was considered the practical thing to build special houses for them, and the term incubator cellar became well known in the industry. They would build an incubator cellar that would in some cases resemble a fruit cellar. That would be half submerged within the ground. They wanted to protect the cabinet from drafts. There were no drafts within the machine and they even wanted to protect the cabinets from drafts, because a draft against one side of the incubator would have a tendency to make that side
39 a little cooler and the eggs then cooler on one side than the other. Those that are too cool will not hatch well and will hatch slower.

Q. What about setting the eggs? How were they set in these cabinets?

A. They were all set at one time in any particular cabinet. It was not the practice at all to have stages of incubation. As a matter of fact the incubators that were operated at that

time, the manufacturers gave instructions to start them at one temperature and keep changing the temperature as the incubation progressed and they didn't consider it was possible to have successful incubation with eggs in different stages in the same machine.

The Court: Did the hen turn her eggs over?

The Witness: Repeatedly. She does it with her feet and also with her beak.

Q. Do you know whether there were any practical incubators in use which had more than one layer of eggs?

A. I have not been able to find any.

Q. Do you know of any reason why?

A. Yes. With simply convectional currents the layer of eggs, if they were placed in two layers, the upper layer would not have the same temperature as the lower layer because they were still air machines and the heat would naturally rise to the top and, if you had it, the top layer of eggs would be much warmer than that immediately below it.

40 Mr. Williamson: If this witness is answering about the whole prior art, then I object to it as being based on hearsay. If he is simply testifying about his own experience as to what he has seen then I have no objection to it.

The Court: I suppose that he is testifying to his experience, and as far as the prior art is concerned the Court will take that from the literature.

Mr. Ely: Yes, simply a foundation for what is to come. I am about through with this, Your Honor.

Q. Do you know what sort of results they would get from these cabinet machines, Mr. Taggart?

A. The results varied greatly with the incubator and the skill of the operator and of course with the condition of the eggs. In 1909, at the time I was especially interested in the work in college, a 50 per cent hatch on the average was considered good. We would have individual cases, where it would run up well over that, but the average hatch, if we got 50 per cent, we supposed it was good.

Q. Now, have you testified in any suits concerning the Smith patent? A. Yes, sir.

Q. Will you please just briefly describe the Smith patent to his Honor? Have you got your copy there, Mr. Taggart?

A. No sir, I have not.

Mr. Williamson: I suppose your question means his understanding of the Smith patent, Mr. Ely.

41 A. The Smith patent calls for a process of incubation whereby large numbers of eggs can be carried from the fresh eggs to baby chicks. It also requires that these eggs be in various stages of incubation, that is from fresh eggs through various stages down to eggs that are hatching. Now these may be in two different stages or may be in a dozen, depending upon the way the operator wishes to set them. It also requires that this—to carry out this process that there must be some power driven current of air, that is not convectional currents, a current of air circulating among the egg trays of sufficient velocity to keep the temperature within the chamber at substantially the same temperature throughout. Reading from page 1, line 40, "The temperature of circulating air should be such as will prevent the eggs in the early stage of incubation from falling below 100° and the
42 speed or velocity of the circulating air should be such as to carry the heat away from the eggs in the later stages of incubation and thereby hold the temperature of those eggs at 105 degrees or slightly below that. It is manifest that the temperature will remain practically the same throughout the column of eggs, but the air is impelled with sufficient velocity to carry the heat away from the eggs which happen to be in the advanced stage of incubation." Now in order to have this air circulating properly to carry out this process the air cannot just pass through the eggs once, and then outside the incubator. If you were to do that as you would be passing fresh air over the eggs all of the time and would dry them out entirely too rapidly, so it is necessary to have restricted openings for the intake of fresh air and discharge of foul air, so that you can conserve this moisture. Now, to carry out this process—in other words, the air must be circulated in cycles, one after the other continuously. If that is not done it is not possible to carry out the process. Now in that way the moisture is conserved and the temperature is kept uniform. Now to carry out this process it is not necessary that these eggs be arranged in any particular order, because if the air is circulating with sufficient velocity it will carry the heat from the eggs in the advanced stage to those in the lesser stage or earlier stages of incubation and keep the temperature practically uniform.

Now to carry out this process of incubation as Smith
43 has described a preferred apparatus. On Fig. 1 he shows a closed chamber with—a cross section of a closed chamber where we have a central corridor and the eggs arranged in columns or tiers on both sides of the corridor. Now Fig. 3 shows one side of this

corridor. You will note that at the top of it or near the top of the corridor there are egg trays that are flat, and these are arranged as stationary. Immediately below that there are eggs in racks, egg trays in racks that can be tilted and again at the bottom there are egg trays that are flat. In this preferred apparatus of Smith's he places the eggs in the trays at the top.

The Court: Which?

The Witness: On Fig. 1 or Fig. 3, either one.

Mr. Ely: Fig. 1, Your Honor, shows.

The Witness: The top 3 trays, as he has shown up there, are stationary, or the eggs are kept flat—all the egg trays are kept flat. The reason for that was at that stage of incubation it was considered desirable or it was considered not necessary to turn them. Of course the hens always turned them, but they considered it was not necessary to turn them at that stage.

In the turning racks that are immediately below there the eggs were placed in there and the racks were tilted with one side down, first one side down and then the other. It was customary to turn these at least twice a day, because the eggs

—the eggs, you will observe, were placed in there on
44 end, in the trays on end, the little end down. Then as the entire tray was tilted to the right or to the left, the egg would be turned at approximately a 45 degree angle. That turning was necessary. The eggs were, as stated before, in this preferred apparatus Smith placed the eggs in these upper trays first, then lowered them as the—as hatching progressed, so that by the 18th day the eggs would be on the bottom of the turning racks. The last three days the eggs were placed in the hatching racks which are at the bottom. There they were again flat. Now in the top of this corridor in Fig. 3, and it also shows—or in Fig. 1, and also shows it in Fig. 3, there are two fans, these fans were so—

Mr. Ely: Your Honor, right here.

The Witness: They are numbered 26.

The Court: 21 and 23.

Mr. Williamson: 18.

Mr. Ely: 18 is the fan. 21 is the motor bracket.

The Witness: Yes. They show two fans, 21 the paddle 18 is shown attached to the fan, of course. In this preferred apparatus he placed the fans at the top with heating coils at the side of them, and the air was forced down this corridor to the floor where it passed in among the eggs and the egg trays, and then it passed upward through the—through and between the egg trays until it reached a point near the top of the incubator. The air was then drawn back into the fans and re-circulated time and again.

45 Q. Just point out—follow that circuit around, will you, Mr. Taggart?

The Court: Comes around here.

A. It comes down from the fan down to the floor and up through and around and is re-circulated.

Mr. Williamson: Well, the curtains there make it go down.

A. Time and again.

Mr. Williamson: The curtains make it go—

A. Now, since Smith placed his hatching trays at the bottom, or the warmest eggs there, they were placed there because of the dirt and litter that would be created at the time of the hatching.

The Court: Those eggs are lowered?

The Witness: Yes sir, in his preferred apparatus he took the eggs out here and lowered them here. We will say these were three days old; we will say seven, ten and eighteen, and these down here we will say are twenty days old.

Mr. Williamson: Well, the curtains have to—

Mr. Ely: Just a minute.

A. Since the hatching eggs were placed at the bottom of the incubator it was necessary that those eggs be kept cool.

The Court: They first received this draft.

The Witness: Yes. In this arrangement, and then the heat—or they are cooled off, the air picks up heat from these and carries it up through and largely between the trays
46 in the column above. You will note that there are wide spaces between the trays when they are turned, and while the air starts up through them it would naturally get over into these air columns and go up the air columns between the trays.

The Court: They come up this air column and then diffuse into here, do they?

The Witness: Yes, sir. Now in order to carry out this process with this preferred apparatus Smith used fans of comparatively low volume, so that it was desirable to have curtains on the sides of the corridor so as to make sure that these eggs in the most advanced stage of incubation received sufficient air currents. Now in so doing the heat would be picked up from these, and would be carried and distributed to other parts of the incubator. After the heat from here passed directly up the air column, it might come around through the fan and around again in recurring cycles. Now as far as the heat transfer is concerned it makes no difference whether the air goes in this direction or if it goes in the other direction because it would pick up heat here and carry it around to the eggs in the earlier stages of incubation. Nor would it make any difference if we had these sandwiched in a different way. For example, we will say the twenty day took the place of the ten day eggs and the three day remained as they were, or in some other arrangement. It would make no difference whether the air went in this direction or air
47 in this direction, the heat transfer would be the same.

The Court: As I understand you, you place these twenty day eggs in the bottom so that the air will come down and strike them first.

The Witness: The principal reason of putting the twenty day eggs at the bottom is at the time they hatch the shells and the necessary litter a part of that hatching will not be dropping down on the other eggs. There are—there have been incubators manufactured in which the hatching was up at the top, but it is a dirty mess; the droppings from the chicks if they remain in the incubator, litter up the other eggs and so, as a matter of convenience, practically all incubators have the hatching at the bottom.

The Court: I thought these eggs, the twenty day eggs, were the hottest, that is, they were producing heat from the inside and it was necessary to apply this air first to them, to drive the hot air off of them.

The Witness: The point is that the air in here is circulating rapidly and we will say that it takes eight seconds to make the trip. It makes no difference where these eggs are placed, because it is continuous re-cycles. It is re-cycling; the same air passes a given point time and time again.

The Court: It could come around this way then?

The Witness: Yes sir, or to carry out the process or
48 the patent, it could come on the side.

The Court: That is it could go in this way.

The Witness: Yes sir, or the column could be on the side.

Q. What is the percentage, actual percentage of total air in the circuit which passes, which is interchanged from outside to inside?

A. I didn't explain the openings for the intake of fresh air and discharge of foul air. Above each side, as shown here, there is a restricted opening for the intake of a certain amount of fresh air, and above each egg column there is shown an opening, 28, with a discharge of foul air.

The Court: Will enough air reach in there so that the foul air will escape in preference to the other air?

The Witness: No sir, there is an interchange of from one to three per cent of air in actual operation every time. In machines of our own manufacture that we are putting on the market at the present time we hold that exchange of air down to one-half of one per cent. We have never put machines out that have over about three per cent.

The Court: What do you mean when you say foul air escapes? You mean that you keep freshening it by bringing in a small per cent of fresh air?

The Witness: Yes, sir.

Q. What happens to the main body of air, that is the 99 per cent?

49 A. The main body of air goes around again and again in continuous cycles.

Q. Will you just show His Honor where that outlet is in the side view. There is only one outlet, Your Honor.

A. There is only one outlet on each side. Here it shows one outlet, each side. There is an intake over each one, but only one outlet over every column. In other words, this machine, preferred apparatus as shown here, has two fresh air intakes and two openings for the discharge of air.

Q. Now, Mr. Taggart, will you just go over that matter of the function of the continuous cycle of air as a heat equalizer, just briefly?

A. As a hatch of eggs in the machine are in a stage to take up heat and half of them are too warm, if we circulate the air in there with full velocity we—one counteracts or tends to counteract the other and one keeps the other warm, and the temperature within the machine stays uniform. Now for ex-

ample, in the machine of the type that is—of the defendant and also of ours that is being shown here, when those machines are full they hold between 3000 and 3500 pounds of eggs.

The Court: How many eggs would that be?

The Witness: We rate ours as 47,000. The defendant rates his at 45,000. Now this is largely liquid, and you can appreciate the amount of heat that is necessary, or either heat or refrigeration, to change the temperature of 3000 pounds of water or 3000 pounds of a liquid and this large mass of
50 eggs serves as a stabilizer and makes it possible for the—the incubator to operate with less change of temperature than if you have the eggs all in one stage of incubation, or have a small incubator which may be affected by outside temperatures.

51 Q. I wish you would take that matter of current circulation, and explain the matter of the different ages of the eggs placed in the circuit.

A. On my sheet here, I am placing the numbers 3, 7, 10, 14, 18 and 20, which would represent the eggs of the different stages in an incubator, or the number of these which we have in the incubator. Now, we have explained that heat is being developed in these bottom three, that is, 14, 18 and 20. The others require heat. Now, as I explained before, that air is circulated in this manner so that that passes 20 first, and then 18, 14, 10, 7 and 3, the heat from these bottom three trays,—the bottom three trays of eggs, will be carried to those in the upper tray, but it does not necessarily mean that it all takes place in the same cycle. If the air is traveling in re-cycles, it may touch 20 this time and not touch any of the others, but, on the next circuit, it may touch 10, 7 and 3, or, if any recurring cycle, it may touch the other. In the same way, it makes no difference if you would go in the opposite direction, because you would pick up heat from those that are in the advanced stage, and it would carry them around to the other points just the same, because the air is going round and round, time and again. Now, if we were to arrange these in a different way, we would have 3, 14, 10 and 7, and 20 and 18. If the air passes down and strikes 18 first, and up through, the heat will be carried from those in the advanced stage
52 to those earlier stages of incubation in just the same way; there, again, it makes no difference whether the air goes in one direction or goes in the opposite direction. Now, we can sandwich those in any particular order we want, and we would still have the heat transferred just the same. Now, if the air is passing from fans, or being propelled by

fans, in continuous cycles, and we have trays we will call 14, 3, 7, 20 and 10, and 18, and we will say the air was passing laterally to that column by a fan, so that it drives the air in there, or if the air is again going in cycles out into the eggs and back into the fan, it might pass through 3, and then through 14, and back into the fans, and, on the next cycle, it might pass out through 20, and back into the fan in another way, and back out again through 7, but in this entire trip it travels in recurring cycles continuously, and if it picks up heat at one time and transfers it at one place, and transfers it to another place, it is accomplishing the same function, or it is accomplishing the process of the patent, because the air must travel in recurring cycles, and it makes no difference which way the air goes so long as that air is traveling in a circuit, and in an identifiable current of sufficient velocity to keep the temperature within that chamber neutral.

Q. You said it does not make any difference about the direction of the air. Does it make any difference about the order of the eggs? A. No, sir.

53 The Court: Well, at the same time, if he put those in various positions, he means to say that the changing of those positions of the eggs would not make any difference, and it would keep the air uniform and equal.

The Witness: Exactly.

Mr. Ely: I think I forgot, when we were talking about heat, to put in these charts, and I think I better do that now, before we get any further. I want to introduce in evidence the first chart.

Mr. Williamson: Did he say he made these charts himself?

Q. Did you? A. Yes, sir.

Q. And from studies conducted by yourself?

A. Yes, sir.

Q. And it is a correct representation of what your findings are, is that correct? A. Yes.

Mr. Ely: Then I will introduce this smaller chart, which is headed "Days of Incubation," as Plaintiff's Exhibit 2.

(Chart referred to marked by the reporter for the purpose of identification as Plaintiff's Exhibit 2.)

Q. What are your answers with respect to the data on this larger chart headed "Record Of Heat Development In Eggs Of The Common Fowl?"

A. I prepared the chart from my own experience.

54 Q. It is correct, is it not?

A. Yes.

Mr. Ely: I will introduce this as Plaintiff's Exhibit 3, the chart entitled "Record Of Heat Development In Eggs Of The Common Fowl", and the photograph attached thereto.

Q. What is that?

A. That is a photograph of this box, or a similar box to the one which I have shown here, in which the tests were made.

Q. That is, the tests which are recorded on Exhibit 3?

A. Yes.

Mr. Ely: I will introduce that as Exhibit 4.

(Chart referred to marked by the reporter for the purpose of identification as Plaintiff's Exhibit 3; photograph attached to Plaintiff's Exhibit 3 marked by the reporter for the purpose of identification as Plaintiff's Exhibit 4.)

Mr. Ely: I will also introduce as Exhibit 5, the sketch just made by the witness, the pencil sketch showing the circuits of air.

(Sketch referred to by Mr. Ely marked by the reporter for the purpose of identification as Plaintiff's Exhibit 5.)

Q. Now, Mr. Taggart, you have spoken about the function of this re-cycling circuit of air on the matter of heat interchange, or heat leveling off. Does it have any function with respect to the evaporation you have discussed in your general discussion on incubation?

55 A. Yes, sir, as the air passes the eggs, it has a tendency to pick up a certain amount of moisture. The dryness of the air will determine largely the amount of moisture that it picks up. Now, if we re-cycle the air, we can keep the air moisture so that that controls the evaporation of the eggs. Theoretically, it might be possible to do it some other way, but it certainly is not a practical way. The re-cycling is not only necessary to conserve the moisture, but it is also necessary to keep the temperature uniform.

Q. That is, how is it that the moisture is conserved by re-cycling? Briefly, go over that.

A. By re-cycling the air, it is kept moist. If it were not re-cycled, the moisture that it picks up would be immediately carried outside of the incubator, and fresh air normally would have to come in to take its place. Fresh air, in practically all climates of the United States, is much drier than the incubator air that is desired.

Q. Now, Mr. Taggart, would it be possible, say in a Smith incubator, or an incubator of any size made under the Smith

Patent, to rely on convection currents to secure these results you have been talking about?

The Court: What kind of currents?

Mr. Ely: Convection currents, merely.

Mr. Williamson: That is objected to as incompetent, irrelevant and immaterial.

The Court: I will hear you.

56 Mr. Williamson: Exception.

A. It is impossible. It has been tried repeatedly, but no one has been able to do it satisfactorily, to my knowledge.

The Court: What kind of currents are you referring to?

The Witness: Convection currents would be currents of air that are set in motion by a difference in heat. For example, the air circulating from the radiator over there, is circulating by what is known as a convection current. That is true because the air, as it is heated, rises, and the cooler air settles on the bottom, and the heat that is generated from the eggs would rise normally to the top of the incubator. There is no one that I know of that has been able to set a large mass of eggs in different stages, and keep it at the right temperature just by a convection current; it requires a forced circulation of air.

The Court: Gentlemen, I think we will stop here and adjourn until two o'clock.

(Recess taken until two o'clock p. m., November 16, 1932.)

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57 Afternoon Session.

November 16, 1932.

(Direct Examination of Mr. Taggart resumed by Mr. Ely.)

Q. Before going ahead, I have a couple of questions in regard to the patent in suit. What does the patent have to say with regard to the speed of the air current?

A. It states first, to carry out this process, it should be of sufficient velocity to keep the temperature within the various parts of the chamber substantially uniform, but, on page two, beginning with line 73, it reads: "It is obvious that the fans can be so arranged and can be operated at such speed as to cause the hot air to circulate fast enough to keep the tem-

perature throughout the chamber between the limits of 100 degrees and 105 degrees."

Q. In regard to that temperature stated in the patent, Mr. Taggart, what is the practical effect of that?

A. That is, in regard to the temperature of the eggs?

Q. Yes.

A. Earlier in the patent, on the bottom of page one, line 47, it states: "And thereby hold the temperature of those eggs at 105 degrees or slightly below that." It is referring to the temperature of the embryo within the eggs. At the time the patent was applied for, it was considered,—100 degrees was considered the minimum, but, since that time, it has been found possible that by increasing the humidity
58 we can go on down lower than that. It is customary now, with some machines, to operate as low as 99; part of the machines on the market operate at 100; part of them at 99½, and 99¼, and some of them as low as 99.

Q. Does the size of the machine have anything to do with the operative temperature?

A. Yes. With a volume of eggs, forty to fifty thousand eggs, for some reason you can go down lower, that is, operate at lower temperature. To illustrate that, the Buckeye Incubator, with a ten thousand eggs capacity, maintains 100 or slightly below, but, as you increase the size of your incubator, you can go down a little with the temperature, that is, to increase the volume of eggs that are operated in one compartment.

Q. Is this incubator illustrated in the patent a larger or smaller machine?

A. As set up there, that would not be over eight or ten thousand eggs, if it is that much.

Q. You are, of course, familiar with the commercial Smith Incubator manufactured under the patent?

A. Yes, sir.

Q. You have some photographs illustrating that?

A. Yes, sir.

Q. How many sets of these photographs have you?

A. I have three.

Q. Where is the other one? I only find two.

59 A. There is one set with your papers.

Q. Will you see if you can find it?

(Witness procures same.)

Q. Are these photographs of the machine, such as you are going to introduce,—such as we are going to introduce in evidence?

A. Yes.

Q. Will you explain just what these photographs show?

Mr. Williamson: Just one moment. If these were taken from some machine which the plaintiff proposes to introduce, I have no objection, but, unless they are taken from a machine that they propose to introduce, I object to them as incompetent, and as calling for secondary evidence.

Q. Are they photographs of a machine which is identical with the machine which you expect to introduce?

A. There is a minor detail or two,—yes, they are the same.

60 A. The photograph that is numbered at the bottom 1476, is a front view of a Smith incubator. 1475 is a view of the same machine taken at a slight angle, that is the incubator manufactured by Smith. This machine is a little over ten feet wide, eight feet two inches high, and is thirteen feet and two or three inches long. It has a rating of forty-seven thousand eggs. The photograph that is numbered 1477 at the bottom of it, corresponds to the front view of the incubator with the front removed. This is to give you an idea of a cross section of the machine, and in order to show all the columns of trays as they are set on the side, the curtain has been pulled back to the back part of the corridor. Then the other photograph, 1478, is a view with the side of the machine taken out, and one column,—the trays on one side taken out; in other words, it shows a cross section down the corridor of the machine. In order to show the columns of trays there, the curtain was left off.

The Court: That was taken on this side (indicating)?

The Witness: Yes, sir.

Q. Which picture were you talking about?

A. That is the picture 1478. That shows the left side

61 of the corridor as shown in 1477.

Q. Does that show the eggs incubating or the tilting trays?

A. This shows twelve trays on what could be called the turning trays, or where the eggs are kept for the first eighteen days. The bottom two trays are known as the hatching trays.

Q. How are the tilting trays supported?

A. They are supported on endless chains at the front, and the rear, and the trays themselves have hardware on them, or metal hooks, so they can hook into the chains.

Q. How many fans are in this size incubator?

A. This machine has four 16 inch Robinson & Myers fans.

The Court: Where are they situated?

The Witness: They are above the center of the corridor. You can see the screen protecting the fan blades below, and if you will look in 1478, you can see them above the fan partition,—four of them.

The Court: Those fans tend to blow this?

The Witness: What you see there is a screen or a shield to protect the fan blades. The corridor there is sixty-two inches high, if I remember correctly.

The Court: Is this the corridor?

The Witness: Yes, sir, and a tall person might become entangled in the fan; in any event, the underwriters asked us to protect them. The blades are such that they throw the air downward in the corridor.

62 The Court: It comes down through those screens?

The Witness: Yes, sir.

Mr. Ely: I will offer this set of photographs in evidence as Plaintiff's Exhibit number 6, the set of four photographs of the commercial Smith incubator.

(Photographs Referred to Marked by the Reporter for the Purpose of Identification as Plaintiff's Exhibit 6, 6-A, 6-B and 6-C.)

Mr. Ely: The photograph, Plaintiff's Exhibit 6, is numbered 1475 and 6-A is 1476 and 6-B is 1477 and 6-C is 1478.

Q. Now, Mr. Taggart, you have prepared, have you not, some scale drawings of the Smith incubator?

A. Yes.

63 Q. Are these the scale drawings which you prepared?

A. Yes.

Q. Will you please just take those and briefly describe it with particular reference to the method of operation. Tell us first what the drawings are, and then go through and make such explanation as you care to.

A. The top drawing is a sectional view across the machine somewhat diagramatically, leaving out certain parts that would only confuse. The two other drawings attached to it are sectional views along the corridor and through the trays, one being in the plane SS, and the other being in the plane RR. The sectional view across the machine shows the central corridor with the trays arranged at different levels on the side of the corridor, with the hatching trays at

the bottom, with a fan at the top of the corridor to force the air downward to the bottom of the corridor, where it goes in and among the trays and the lower part of the machine, and thence upward through out and above the tray columns; thence down back into the fans and re-circulated in continuous cycles. At the top above the fan we have shown an opening there for the intake of fresh air. In the machine, —from this diagram here made we have only one fan, however,—only one intake opening above the fan,—that is through the entire incubator, and in the one we have a photograph of, there is one over each fan. On the side above the tray columns there is an opening for the exhaust of air.

The fan operates so that it forces the air down, as I
64 said before, and in order to make the air carry to the bottom of the incubator where the hatching eggs are located, we have curtains at the side of the corridor to direct sufficient air to the bottom, to pass through those trays for the purpose of keeping them from becoming too warm. Now, if we turn to the diagramatic section SS, I have represented there a section through the corridor with the four fans at the top. You will notice the position of the air intake which is in the middle of the roof. At the sides of the corridor, the shaded portion represents a curtain, and that covers the egg trays that are in the turning position. The arrows coming down from the fan represent the air movement down the corridor, and this same statement could apply to the first view we have here. Across the top of the incubator we have a number of circles with a plus sign in the center, and a figure given at the side. These circles represent the position in which we place anemometers to tell the direction and speed of the air current which is passing that point. A plus sign means that the air is flowing towards the fan, that is, flowing towards the person that is reading them, standing in this position. The minus sign would mean they were flowing in the opposite direction. The numbers give the approximate speed in lineal feet per minute. You will note there is a space there, a small space at the top and immediately behind the fan, and that represents a supporting beam. You can see that quite well in the cross section. It supports that side of the trays.
65 You can get it in this cross section here, Your Honor. The beams at each side, they support this front end of the tray, and so those readings were taken between the beams and the roof of the incubator.

Mr. Williamson: Will you speak just a little louder.

The Witness: The readings were taken between the beams and the roof of the incubator. Now, at the bottom of

the curtain, or below the curtain there is a hatching rack, and there again there are a number of circles which represent the position in which anemometers were placed. The minus sign in these circles show that the air is moving away from the observer,—I would say moving into the egg tray section. The numbers at the side of the circle again represent the approximate speed of the air in lineal feet per minute.

Q. What is the speed of the air as it comes down through the central corridor?

A. As it leaves the fan it has velocities up to as much as 1200 feet per minute; that is where it immediately leaves the fan, but, as it goes downward in the corridor, it spreads out, and this speed diminishes so that the farther away from the fan you are, the less speed that you have. It crosses underneath the trays or underneath the curtain at from 200 to 250 feet per minute. It passes underneath the hatching rack at the very bottom, at 200 to 300 feet per minute, varying at different points. It comes over the top of the beams,
66 back into the fans at a speed of approximately 700 feet per minute.

Q. What about the speed up through the columns of trays?

A. The speed through the trays themselves is so small that it is almost negligible and it is very difficult to record, but in the air space and between the columns of trays, as shown in this drawing, or as shown in RR,—it is shown in RR better—the columns of trays as they hang onto the chain in this tilted position, or operating position, they leave an air space between them and practically all the air that passes underneath the curtain goes up between the tray columns. There is a small amount of it that diffuses in between the trays, but, the big portion of it goes up the air column. The speed of it there may vary from practically nothing up to as much as 110, or perhaps 150 feet, at times, per minute.

Q. What about the length of curtains?

A. In this sketch the curtains are shown as being from five to six inches above the top of the hatching racks. They are shorter here than those shown in the patent.

Q. What has been the history of that matter of curtain length?

A. As we increase the velocity of the fans, we require less directing force and shorten the curtain. Originally the fans were much smaller and the curtains were longer. At times the curtains have been entirely omitted.

Q. Is it feasible, then, to operate the Smith incubator without the curtain?

67 A. We do not advise it, although some operators have done so, but, we do not advise it.

Q. Is there anything about the relation between the speed of the air and the presence of the curtain?

A. Yes. With curtains we can use a lower velocity air current. As you shorten the curtains, it is necessary to increase the fan volume or velocity so as to be sure that you force the air around the eggs in the most advanced stage of incubation.

Q. That is those eggs in the hatching process?

A. Yes.

Q. You are prepared to demonstrate, with the curtains removed, what happens?

A. You would still have air currents up to the egg columns in all points except in the lower part or the columns near the corridor, and there the fan current would be going down for a short distance, that is, near the bottom of the curtains, and then curving back up, but with the curtains we get a little more uniform and better distribution of the air in the back corners of the machine.

Q. That is, with what velocity of air do you get that?

A. Well, the velocity that we use at the present time and what we are using, as shown here in this picture, is 1200 feet per minute from the fan and we use a curtain that is approximately 18-½ or 19 inches from the floor of the incubator.

68 Q. What does the volume of air in motion have to do with that?

A. Well, the greater the volume that you move in in any chamber means you have to increase the average speed of it and, of course, as you increase the average speed through there, you would get uniform distribution, and if you increase it high enough, you will get uniform distribution of temperature without curtains just as well as you do with curtains.

Q. You are familiar with the Buckeye machines, are you?

A. Yes, sir.

Q. Do they have the same chain type of racks or do they have racks similar to those shown in the patent?

A. The Buckeye use racks similar to those shown in the patent.

The Court: Do you call the machine you manufacture the Buckeye?

Mr. Ely: No, we make the Smith. The Buckeye is the licensed machine.

Q. Will you just explain that to the Court?

Mr. Williamson: Is he competent?

Q. You are, aren't you?
A. Yes.

Mr. Williamson: All right.

A. The Buckeye Incubator Company, of Cleveland, Ohio, and formerly of Springfield, Ohio, manufacture incubators under the Smith patent, up to a capacity of 16,500
69 eggs. Dr. Smith reserved to himself the privilege of manufacturing them from 25,000 on up. The Buckeye has an exclusive license to manufacture under the patent.

The Court: To what?

The Witness: To 16,500.

Q. In the operation of the Buckeye machine, or rather put it this way,—I don't know whether you answered my question or not. The Buckeye machines do not use this chain type, do they?

Mr. Williamson: That is objected to as incompetent, irrelevant and immaterial, he not having shown himself to be qualified to answer.

Q. Aren't you familiar with the Buckeye machine?
A. Yes.
Q. Will you please tell me what type of hanger they use?
A. For the turning rack, the Buckeye uses a turning rack, from which the eggs are suspended, and this rack is almost identical to the one shown in the patent, in which the eggs are shown so they can be tilted from side to side.
Q. Do you know whether or not in the operation of the Buckeye machine they shift the eggs in the columns?

Mr. Williamson: That is objected to as immaterial.

A. It has been customary most of the time, although many operators do not do it. They put the eggs in a given position and leave them there until the eighteenth day, when they take them out and put them in the hatching rack.
70 In fact, the Buckeye has sold some machines in which they recommend that to be the method to follow.
Q. Are you familiar with the construction and mode of operation of the defendant's machine?
A. Yes, sir.
Q. How did you become familiar with that?
A. First, through advertising matter that was put out by Mr. Snow, and then through observation of the machines

in operation, and then later I was invited to Sleepy Eye, where we held a demonstration with one of the machines, at which time I had opportunity to take detail measurements of it and the operation was explained to me by Mr. Snow.

71 Mr. Ely: Before I go any further, I forgot to introduce that set of scale drawings, testified to by the witness, and I offer them as Plaintiff's Exhibit 7, Plaintiff's Exhibit 7-A, and Plaintiff's Exhibit 7-B.

(Documents marked Plaintiff's Exhibits 7, 7-A and 7-B, for identification by the reporter.)

Mr. Ely: Now, Plaintiff's Exhibit 7 is the sectional view across the machine, through the fan.

Plaintiff's Exhibit 7-A is the sectional view on the line "ss" of Exhibit 7.

And Plaintiff's Exhibit 7-B is the sectional view on the line "rr."

By Mr. Ely:

Q. You referred to some advertisements of Mr. Snow,—put out by Mr. Snow; are these the advertisements to which you referred, Mr. Taggart? (Documents submitted to the witness)

A. Yes, sir, they are.

Q. How did you get hold of them?

A. There was someone in the country who sent them in to us, in the mail.

Mr. Ely: (To Mr. Williamson) These are Mr. Snow's, aren't they? (Documents submitted to Mr. Williamson)

Mr. Williamson: If Your Honor please, this question and the witness' answer are objected to as incompetent, as calling for secondary evidence, it not appearing but what the machine itself could be introduced.

72 I will say that we offered to stipulate to submit our machine, if Your Honor please, and that machine is here in the Flour Exchange, and we are ready to stipulate as to that now. And we have scale drawings of that machine, and we are willing to stipulate as to those scale drawings, and we have photographs of the machine, and we are willing to stipulate as to the photographs of the machine, so that we will have before the Court the actual machine which Mr. Snow has made. It seems to me that this indirect way of

proving what we have made is all wrong; it is secondary evidence, and incompetent.

The Court: Have you looked at his proposition, that is, the drawings and photographs of the machine?

Mr. Ely: Well, Your Honor, I want to state that our visit to Sleepy Eye was the result of a motion by Mr. Williamson for particulars as to the claims in suit, and we said that we would stipulate the claims if he would let us see his machine. So he invited us down to Sleepy Eye, and we saw the machine down there. And I might state that one full day we took complete measurements of it. Now, this machine which he has here in Minneapolis is not the same machine that we saw in Sleepy Eye, and it varies in some detail. Therefore, it may be important as to some measurements and readings. The machine which we saw, that Mr. Williamson has here in Minneapolis, is not the same machine as the machine that Mr. Snow was making and put on the market. The difference is
73 that the fans are similar on this machine, but they run at a lower speed than the machine that we saw. So we propose to go ahead, with Your Honor's permission, and prove what was shown to us at Sleepy Eye in September, as the machine that Mr. Snow was using.

Mr. Williamson: The motion would have been granted, Your Honor, whether it had been opposed by Mr. Ely or not, but at his request, after he asked permission to see that machine at Sleepy Eye, we told him that that particular machine in Sleepy Eye was in the basement of the building, and that is the machine that Mr. Snow had made and used before this suit was brought; that was a steam heated machine; and at that time we showed that machine to Mr. Ely and Mr. Taggart, I did not know that it was built into the framework of the building and could not be brought to Minneapolis; I did not know that until long afterwards. And then, they had this other machine made, and the only difference between that and the machine in the basement at Sleepy Eye is that the one in the basement at Sleepy Eye was steam heated, and the one that he has now in Minneapolis is electrically heated. That is the only difference between the two machines. And that machine that is electrically heated was a knocked down machine, and therefore that was the only machine that he could bring here to Minneapolis. It is impossible, without tearing that machine all to pieces, the one that is in the basement of the building at Sleepy Eye, in order to bring it here

to Minneapolis. That is why we could not have that
74 same machine brought down here; it would be impossible to do so. And I did not know that that was the fact when we showed him that machine in the basement of the plant at Sleepy Eye. But the machine which we have got here is an exact duplicate of the four machines that Mr. Snow made and used within the jurisdiction of this Court, before this suit was brought. And this particular machine that we have got here, and are willing to stipulate to, is a machine that was made in the jurisdiction of this Court by Mr. Snow, before this suit was brought, and was used for demonstration purposes in explaining the operation of this machine to prospective customers, and the only difference between these two sets of machines is that one set, the earlier set, was steam heated, and this later set was electrically heated; and that machine is right here, and we have tested this machine here very thoroughly, under the supervision of Professor Rawley, giving notice to Mr. Ely, the counsel for the plaintiff, and we are prepared to put these tests in, and to take you down and let you see the machine in operation. Now, that is the machine that we ought to have here, and I am willing to stipulate to that. Now, this going way around, by showing advertisements, and so forth, of our machine, I submit that that is incompetent testimony; it is secondary evidence, when we have got the machine where you could see it.

The Court: Well, of course, if this testimony is competent, he has a right to make use of it. But, if you have
75 other evidence which is competent, that should be shown. I think if the testimony shows that they went down there, and you showed him your machine,—

Mr. Williamson: (interrupting) That was done at their request, out of courtesy to them. We are perfectly willing that they should put in whatever tests were made of the machine there, but we are not willing to have them put in a machine which they have made, and call it our machine.

The Court: Well, they have the right to describe the machine that they saw.

Mr. Williamson: Yes, the machine that they saw.

Mr. Ely: Well, do I understand the status of this is,—I offer these advertisements in evidence.

Mr. Williamson: I object to these as incompetent, and calling for secondary evidence.

The Court: You are admitting that they are your advertisements, are you?

(Documents submitted to Mr. Snow by Mr. Williamson.)

Mr. Williamson: The defendant admits that this particular sheet which I have now in my hand, was issued by him, and contains a cut, taken from a photograph of his steam heated machine.

These others do not contain any cuts of the machine.

Mr. Ely: This is all a part of one advertisement.

Mr. Williamson: And this other piece that I hold
76 in my hand now, shows an exterior perspective view of one of his steam heated machines.

The Court: They may be admitted in evidence.

Mr. Williamson: But it is impossible for us to have that machine here. We have drawings of the machine, and we have photographs of the machine, which we will stipulate to. We have photographs of the very machine which is in the basement of the plant at Sleepy Eye, which we will submit in the case, if you want to use them.

By Mr. Ely:

Q. Mr. Taggart, while we are right on that subject, when we were at Sleepy Eye, did you take measurements of that machine that was shown to us at that time?

A. Yes, sir.

Q. And you recall that machine was shown to us as the machine that Mr. Snow was building at that time, is that right?

Mr. Williamson: I object to that as leading.

The Court: Don't lead the witness.

Mr. Ely: If Your Honor please, I will make a statement, then, that that machine was shown to us as the machine which Mr. Snow was operating,—was shown to us on September 29, 1931, after the bill of complaint was filed, so that we might designate the claims which were in suit, and Mr. Taggart and I went down there to see that machine, and examined it, and measured it, and that is the machine on the basis of which we went ahead with our suit.

By Mr. Ely:

Q. Now, Mr. Taggart, you saw this machine that is
77 over in the Flour Exchange the other day, did you not?

By Mr. Ely:

Q. And you took measurements of that machine, did you not? A. Yes, sir.

Q. Did you find any difference between that machine in the Flour Exchange, and the one that we saw at Sleepy Eye?

A. Quite a number of differences.

Q. What were the principal differences?

A. In the first place, the fans were fifteen per cent smaller, that is, approximately fifteen per cent smaller.

By the Court:

Q. In which machine?

A. In the machine shown here in the Flour Exchange. Their average rate of speed was five per cent less than the average rate of speed of the machine shown at Sleepy Eye; they were fifteen per cent smaller, and rotating five per cent less.

There was a difference in the hatching rack, in the space underneath the hatching trays; as shown to us in Sleepy Eye, it was four and one-half inches, and in the machine in the Flour Exchange, it has been increased to seven inches.

78 The machine shown us at Sleepy Eye was seven feet seven inches high, and the one shown down here is five inches lower. This machine is a little wider, and the corridor is four inches narrower, and it is about four inches longer.

The tray arrangement,—the trays as they hang on the columns are spaced three-eighths of an inch farther apart; that is, the columns of trays, twelve on a side of the incubator, the same as we have; they down there were spaced three-eighths of an inch closer together than they are in this machine here.

Q. What about the space between the ends of the sides of the trays and the side walls or end walls of the machine?

A. They are a trifle closer in that machine, that is, the end tray column,—

By the Court

Q. (interrupting) In what machine?

A. The end tray columns that go in the machine here in the Flour Exchange were a trifle closer to the front and rear wall, than the machine at Sleepy Eye. The wall at the back of the tray columns, that which would be the sides of the incubator, they were two inches farther out.

These differences make certain differences in the speed and the velocity and direction of air flow in the machine.

By Mr. Ely:

Q. And the difference in the diameter of the four fans is—what?

79 A. The fans shown us at Sleepy Eye were five feet in diameter. The fans shown down here are fifty-six inches in diameter, or four inches less in diameter, which amounts to approximately fifteen per cent less in area.

By Mr. Ely:

Q. And what was the speed of the four fans in the Sleepy Eye machine?

A. The average speed in the Sleepy Eye machine was 211 RPM.

Q. And were the speed of the four fans approximately the same throughout the machine?

A. Yes, sir; they varied from 208 to 217 RPM.

Q. Now, what about the speeds of the four fans in this machine down at the Flour Exchange?

A. In the machine down here, they varied from 180 some to 220 some,—I have forgotten the exact numbers, but the average speed was only 201 RPM.

Q. And one fan was running much faster than the other, was it not? A. Yes, sir.

Q. Now, do you recall me asking Mr. Snow whether he had ever operated that machine that was down in the Flour Exchange?

80 A. Yes, sir.

Q. And what did he state?

A. He stated that it had never been operated.

Mr. Ely: Now, if Your Honor please, what we propose to do is this: We built a machine back in Cleveland, after we came back from Sleepy Eye, in exact accordance with the dimensions of the machine that was shown us, and that is the machine on which we have prepared our case, and we have that machine here, and it is an exact duplicate of the machine which was shown us in Sleepy Eye, and this machine here is not. So, with Your Honor's permission, we propose to go ahead, to prove up that machine.

Mr. Williamson: If Your Honor please, we object to that machine on the ground that that is a machine that was not made by the defendant; it is a machine which they have made, —which the plaintiff here has made. We have never been permitted to see it; we have never been permitted to make any tests of it, and we don't know whether it is a correct re-

production of our machine or not. If they wanted to introduce it as the plaintiff's model of the defendant's machine, that would be one thing, but to introduce it as our machine, we certainly object to that. It was never made by the defendant in the jurisdiction of this court. And we offer to produce here photographs of the Sleepy Eye machine. Of course, we have no objection to their introducing evidence of what they saw there at Sleepy Eye, at the time that they came
81 there to look at it. We will furnish them photographs of that machine, and they can put in testimony as to the tests made, and we will put in testimony of our tests, but the machine that we have got here is exactly like the machine which Mr. Snow did make and market in the jurisdiction of this court, before this suit was brought, and this particular machine was made in this jurisdiction before the suit was brought. The machine is standing up there for demonstration purposes to prospective purchasers. And there has been, I understand it, some of the identical parts that were on the machine in the basement of the plant at Sleepy Eye,—the motors and the pulleys, and everything of that type, were taken off of the Sleepy Eye machine and put on to this machine, so as to have it identical. It is our machine the way we market it. The four other machines, besides this one that is here in the Flour Exchange, were made and put into use before this suit was brought.

Now, of course, we have no objection to their putting in testimony as to what they saw at Sleepy Eye. They saw one of our machines. We could not bring that machine down here, because it was built into the building, but we will furnish them photographs of the machine, that were taken when it was in use, if they want to have them.

But we propose to put in this machine that we have got at the Flour Exchange, and we propose to put in scale drawings of that machine, and photographs of that machine, and
82 that is the machine that we marketed,—that is the machine that we marketed. Now, we don't care to be bound with this machine that they propose to put in, because they made it; we have not seen it; we don't know whether it is a correct reproduction of our machine or not. If it is put in, it ought to go in simply as the plaintiff's model of the Sleepy Eye machine.

The Court: Of course, they could not put it in as anything else but plaintiff's model.

Mr. Williamson: With that understanding, I will permit it to go in.

The Court: As plaintiff's model of your machine.

Mr. Williamson: Yes, as plaintiff's model of our machine. Now, I have not seen it, Your Honor, and I reserve the right to object to it, after I have seen it. But these advertisements at this time,—are we waiting for them? Do you want our photographs or not?

Mr. Ely: Well, his Honor has admitted these advertisements, as I understand it. Have you admitted these in evidence, Your Honor?

The Court: I have admitted them, yes.

Mr. Williamson: Exception.

Mr. Williamson: There is some evidence as to them that I want to put in.

Do you want the photographs of the Sleepy Eye machine?

Mr. Ely: We will go ahead and prove our machine,
83 Mr. Williamson.

I ask to have these documents marked as Plaintiff's exhibits.

(Documents marked Plaintiff's Exhibits 8, 8-A and 8-B, for identification by the reporter.)

By Mr. Ely:

Q. Mr. Taggart, when did your company first learn about the infringement of the machine complained of?

A. Three years ago.

Q. Did you make an attempt to buy an exact machine on the market? A. Yes, sir.

Q. How far along did you get with those negotiations?

A. We at one time had five hundred dollars paid, and a contract signed by one or our men, and accepted by Mr. Snow, but after he had accepted the money,—

Q. (interrupting) After he had accepted the money?

A. Yes, after he had accepted the money, he sent the contract back, and sent the check back.

Q. So you were not able to obtain a Snow machine on the market, is that correct?

84 A. No, sir, we tried repeatedly.

Mr. Ely: It seems to me that this is very material.

The Court: Well, I suppose one reason for offering these in evidence is to excuse the fact that they are offering some other model, instead of one of your machines?

Mr. Ely: That is exactly it.

Mr. Ely: We offer in evidence the purchase contract, as Plaintiff's Exhibit 9.

(Document marked Plaintiff's Exhibit 9 for identification by the reporter.)

Mr. Williamson: The same objection.

The Court: The objection is overruled.

Mr. Williamson: Exception.

By Mr. Ely:

Q. After you came back from Sleepy Eye in September, what did you do about building a machine?

A. Oh, we first tried again to purchase a machine. We tried to get admission into some of Mr. Snow's plants, so that we could make tests on one of his machines, but found that he had given instructions for us to stay out, and we then built a machine as near in conformity to the machine that we had been shown, as we could.

Q. And that machine has been built, has it? A. Yes, sir.

Q. And you have made extensive tests on that machine?

A. Yes, sir, it was built under my instructions and in conformity with my dimensions and drawings, and I have run extensive tests with it; I have tested it from a number of

85 different angles.

Q. And that machine is now in Minneapolis, is it not?

A. Yes, sir.

Q. And do you have photographs of that machine?

A. Yes, sir.

Mr. Williamson: We repeat our objection to these photographs, if Your Honor please, and any tests of that machine. We were not invited to be present at those tests. There is no weight to ex parte tests. It has been held by our courts that there is no weight to such evidence unless counsel for both sides are present. It has been held to be of no weight in patent suits; such tests must be taken in the presence of counsel for both sides.

The Court: Well, that is very true, but in this case they are offering these because of the claim in this testimony that they were unable to procure one of your machines and bring it into court.

Mr. Williamson: At least local counsel have indicated that they were willing to stipulate as to a machine for use in the trial of this case.

The Court: Well, I think it is admissible.

Mr. Williamson: Exception.

Mr. Ralph E. Williamson: If Your Honor please, there is one thing that probably should be called to Your Honor's attention, in connection with the tests, and that is that we noticed the tests of our machine, on the Snow machine
86 that is here at the Corn Exchange in Minneapolis, and that counsel for the plaintiff and his expert, Mr. Taggart, appeared at those tests.

Mr. Ely: I object at this time to the tests, because the mechines were different.

Q. (By Mr. Ely) Now, Mr. Taggart, will you take those four photographs that I have handed you, of the plaintiff's model of the Snow machine, and will you explain what they are?

Mr. Williamson: I object to the question as grossly leading. If he will ask him if these are photographs of the plaintiff's machine, I will have no objection to the question.

By Mr. Ely:

Q. Well, are these photographs of the plaintiff's machine?

A. These are photographs of the model which we built in conformity to the information that was given us at Sleepy Eye.

Q. Will you go ahead and state what they are, and will you make such comparisons as you wish to make, with the photographs of the Smith machine, those that have been offered in evidence?

A. Photograph Number 1475 is a photograph of the machine from the front,—

Q. (By the Court—interrupting) You are talking about —what?

A. Number 1472; I beg your pardon. Number 1471 is
87 a photograph taken of the same machine at an angle. Number 1473 is a photograph of the same machine with the front entirely removed. And photograph Number 1474 is a photograph of the same machine,—the side of the corridor.

These photographs were taken under my instructions from the same angles, and the same distance away, as the four photographs that I showed, or that were introduced of the Smith machine.

Q. (By Mr. Ely) Do you find any points of similarity that you want to call His Honor's attention to between those two photographs?

(Previous question read by the reporter.)

By Mr. Ely:

Q. Those two sets of photographs, the set of the Snow machine, of the model, and the set of the Smith machine?

A. In photograph 1473 of the Snow machine, which is a photograph with the front removed, compares with photograph 14,—

The Court: (interrupting) Just a moment until I get that,—all right,—no, I have 1478.

A. 1473 and 1477.

By Mr. Ely:

Q. Now, which is which, Mr. Taggart?

A. 1473 is a photograph of the Snow model which we [conducted] and 1477 is a photograph of our machine.

Q. Now, the Smith machine?

A. The Smith machine is taken from the same dis-
88 tance and the same angle. The trays in the two machines are almost identical. The length of the trays are exactly the same length. The tray in the Smith machine is three-sixteenths of an inch narrower. The same number of trays are used in the turning racks, and they are spaced with the same distance apart, to the one-sixteenth of an inch, as the twelve trays which hang in the turning rack.

The trays that are in the hatching racks, the air space underneath the bottom most tray in the Snow machine, or in the model of the Snow machine, Number 1473, is one inch higher than in the Smith machine.

The two trays in the hatching racks are spaced on four and one-half inch centers,—the same in both of them.

The width of the hatching rack partitions, those that I refer to,—these hatching racks, are made up of sheet iron, as I have photograph Number 1458 here (indicating); we have others of those that we can use. That shows what I mean by the partitions here, hatching racks (indicating). Those are on the same centers. That particular one is a picture of the hatching rack (indicating), that was constructed for the Snow model.

The inside height of these machines are within a half inch of each other, the Snow machine being a half inch taller on the inside dimensions than the Smith machine.

As to the length of the two machines, the Snow machine is slightly longer.

89 Q. How Much?

The Court: By the length, you mean this way (indicating?

A. Yes, sir, the length of the corridor. It is about two and one-half inches,—I have forgotten the exact dimensions on that. But on the sides of the corridor, as shown in photographs 1474 and 1478, 1474 being the one to the left of you, Your Honor (indicating),—1478 is the sides of the Smith machine,—the side of the corridor, and Number 1474 is the side of the Snow model.

There are exactly the same number of trays hanging in the chains in each column. They are spaced exactly the same distance apart. There are the same number of columns. The spacing is approximately three-eighths of an inch different.

In both of them, the heating coils and cooling coils are in the space above the corridor.

In both of them, there are the beams at the side of the corridor for the support of the trays. While both of them are supported on the corridor side by chains, that is, the trays are supported by chains, the type of the chain is the same, or almost identical, but the method of supporting them is different.

In the Snow machine, or the Snow model, as shown in Number 1473 (indicating), the fans are on the side wall behind the column of trays. You can just see the tips of them there (indicating). I have the picture showing that.

90 Mr. Ely: Yes. All right.

A. There are two fans on each side of the incubator, behind the trays. These fans were five feet in diameter; each of them had four blades, and these blades were four inches wide, and they were set at an angle of forty-five degrees. You can just see the tips of them sticking out behind the tray [tray] columns in Number 1473 (indicating).

The Court: They are over next to the wall?

A. Yes, sir; there are two on each side wall.

By Mr. Ely:

Q. There are four fans in the incubator?
A. Yes, sir.
Q. And how many fans in the Smith machine?
A. Four fans.

Q. Go ahead with anything else that you wish to, Mr. Taggart.

A. And in the Smith machine the fans are in the top of the corridor, and there are curtains arranged at each side of the corridor, to direct the air to the eggs in the bottom most tray.

By the Court:

Q. In your machine, that is, the Smith machine, the fans are up here (indicating)? A. Yes, sir.

Q. And in this Snow machine, they are over on the side next to the wall, is that right? A. Yes, sir.

By Mr. Ely:

Q. What about the opening for the interchange of air
91 from the inside to the outside, and where are they located with respect to the fans in each machine?

A. In the Snow machine, as shown in photograph Number 1460, there are holes in the wall, immediately behind the fan. You have the picture upside down, Your Honor (indicating).

By the Court:

Q. These holes (indicating)?

A. Yes, sir, only there are three above each fan center, and five below, as shown here (indicating).

These holes were in the machine, as shown to us by Mr. Snow, but he advised us that he had been operating with the bottom row of five holes closed.

Q. Do these holes go into the,—

A. (interrupting) They go through the rear wall, or they go through the side wall of the incubator, to the outside.

By Mr. Ely:

Q. And what are they for?

A. They are for the purpose of intake of fresh air. If Your Honor will just refer to Number 1471, you will find it on this side here (indicating). You will notice at the side of the incubator, that there is a motor and two pulleys, with belts attached, so that the motor with the pulleys and belt arrangement were for driving the fans inside.

The box like arrangement immediately above the holes, covers the intake holes, that is, the upper intake holes, which Mr. Snow was using; that is, the air entered the ends of this box like arrangement on the side, and then into the
92 incubator through these holes back of the fans.

The bottom holes, which are shown there at the level of the motor, were not used by Mr. Snow. They were a part

of the incubator, but he had them closed at the time we had our demonstration at Sleepy Eye.

By the Court:

Q. You refer to these here (indicating)? A. Yes, sir.

By Mr. Ely:

Q. Now, what is the relationship of the holes with respect to the fans in the Smith machine, and the holes for the inlet air with respect to the fans in the Snow machine?

A. In both cases, they are immediately behind the fans.

Q. Now, will you point out this restrictive outlet opening in the Snow machine?

A. In the Snow machine, there are two outlet openings in the ceiling immediately above the corridors. They are seven inches in diameter. These openings were restricted by a damper, or a slide, with which you could close them. In these pictures, that slide does not appear.

Q. What is the relative area of the inlet and outlet openings in the Snow machine and in the Smith machine?

A. They are practically the same.

Q. Now, will you be a litte more definite on that?

Mr. Williamson: That is grossly leading, if your Honor please, and I object to that question on that ground.

The Court: Well, I cannot see that it is leading.
93 It does not seem to be leading. The objection is overruled.

Mr. Williamson: Exception.

A. In the roof of the Snow model, there are two outlet openings that are seven inches in diameter. In the side walls of the Snow machine, as shown to us in operation, there were twelve 2 inch openings.

Q. You mean inlets?

A. For the inlet of air; although there were twenty holes in the machine that had been restricted or closed, the sum total of the outlet openings in the Smith machine, and the outlet openings in the Snow machine, are almost the same; that is, the total area of the restricted openings in the two machines are almost the same.

Q. Well, just what difference is there, approximately?

A. I cannot give that to you without doing a little figuring; for example, there are two 7 inch diameter openings in the Snow machines, and in the Smith machine, as it was originally constructed, there were four openings of 6½ inch diameter, but four years ago that was reduced to six open-

ings, 4 inches in diameter. There is a very close similarity to them as they are arranged, and particularly since they are or can be dampered or restricted, you could make them exactly the same.

Q. The difference is merely a fractional difference of an inch or so?

A. Yes, sir, in the matter of the adjustment of the operator.

94 Q. Now, are there any other similarities in construction that you want to point out?

A. (No answer.)

Q. Any other identity of arrangement other than you have already referred to?

A. There are a number of little details that are similar, even to the manner in which it is painted, and the way the trim is put on, the type of instrument that is used for controlling the temperature.

Q. With what color do you paint your incubator?

A. Mahogany.

Q. And what color does the defendant paint his?

A. Mahogany stained.

Q. Now, what about the arrangement of the eggs? Did Mr. Snow tell you how he arranged the eggs in that machine?

Mr. Williamson: That is objected to as hearsay.

The Court: It is hardly hearsay, if it were told to him by Mr. Snow.

Mr. Williamson: Exception.

By Mr. Ely:

Q. Well, did he tell you how he arranged them?

A. Yes, sir.

Q. What did he tell you?

A. In traying his eggs, he places the eggs on the little end in the tray, and stacked them in there, or arranged them in the trays so that the eggs would be standing on the

95 little end. Then when they were placed into the incubator, he would turn them into the columns, to an angle, the same as we turn them in the Smith machine, so that the egg arrangement from that manner was identical.

Now, the type of equipment that Mr. Snow has here for supporting these trays are such that the trays cannot be lowered but a trifle, that is, they cannot be successfully lowered, and they are placed in a given position, and left

there until the end of the eighteenth day, when they are taken out and put into the hatching rack.

Mr. Snow took pains in setting, to sandwich his eggs at different stages of incubation; for example, it is customary in the Smith machine, and also in Mr. Snow's machine, to set two trays in each column at a time. There is only space for hatching two trays at a time; so he would only set two trays in each column, and in setting these, he would put one tray at a given position, and the other tray, three or four trays from it, in the same column. Then, when he would set the next time, he would have trays placed in corresponding position, so that no two trays in the same column, touching each other or adjoining each other, would be of the same eggs; in other words, the eggs of different settings of incubation are sandwiched throughout the eggs on the turning rack, so that when they get down in the hatching rack, then the trays are both of the same age of incubation.

Q. That is to say, during the progression of incuba-
96 tion in the Snow machine, how are the eggs arranged with respect to old eggs, say, and new eggs?

A. There might be an eighteen day old egg on the bottom tray, and a three day tray immediately above it, and a ten day tray above that. There were no two trays of the same age together; they were sandwiched throughout.

Q. And what result do you get from this sandwiching there?

A. It operates in equalizing the temperature. In this big reservoir of heat, the eggs are heated by the method of sandwiching in between the eggs that need heat.

Q. Now, we will look at that photograph of yours, of the fans on the back,—will you call attention to which one that is, please? A. It is photograph Number 1460.

Q. Did you ever see fans like that in an incubator before?

Mr. Williamson: That is objected to as immaterial.

A. Yes, sir.

Q. Who used fans similar to that?

A. The Robbins Incubator,—

Mr. Williamson: (Interrupting) That is objected to as immaterial. I don't see what that has to do with the issues in this case.

The Court: Well, I can hardly see at this point, as to whether it is or is not material.

Mr. Ely: Well, it is material because these fans are an exact copy of the fans that were used by Robbins, and
97 it has been held to be an infringement out in California.

Mr. Williamson: I think that is a long way off, and unless you have the record in that case here, you cannot make a comparison, Your Honor; and, Your Honor, that is not set up in the pleadings.

The Court: Well, if I can be convinced that that is the same,—they will have to show me. The objection is overruled.

Mr. Williamson: Exception.

Mr. Williamson: It seems to me it is immaterial.

The Court: I will not prohibit them to find out, to the extent of what it shows.

By Mr. Ely:

Q. Compare those fans with the fans that were used in the Robbins machine.

Mr. Williamson: The same objection.

The Court: Objection overruled.

Mr. Williamson: Exception.

A. I have here a catalogue put out by the Robbins Incubator Company at Denver, Colorado, and on page eleven of this catalogue it shows a model of one of their incubators, with the trays removed, and the framework for the trays still in there, and on the back wall of this catalogue, or on this cut, it shows two fans. These fans are again shown on page twelve. This page twelve is a diagrammatic view of the fan as shown by the manufacturer Robbins. You will note there the motor and pulleys and the blades of the fan
98 (indicating). Now, those blades are on the inside of the incubator; the pulleys, belt and motors are on the outside of the incubator. You will observe these blades on the rear wall of page eleven. That is just back from where you are, Your Honor (indicating). They show on the rear wall there (indicating). These blades, or these fans, as put out by Robbins, and as exhibited and made a part of the evidence in the California case, which they refer to, are five feet in diameter; they have a four inch blade; the pitch of the blade is approximately forty-five degrees, and compare with the blades shown us at Sleepy Eye, in practically every detail.

Q. What about the speed of rotation of the fans?

A. The speed of rotation at Sleepy Eye was an average of 211. Those in the Robbins case, or in the Robbins machine, they recommend that they operate them from 200 to 220, and in a test made in the California case, they ran at 212.

Q. And is that machine that is shown in this photograph, and this catalogue, is that the same machine that was in California?

A. Yes, sir.

Mr. Williamson: The same objection.

The Court: The objection is overruled.

Mr. Ely: I will offer in evidence,—wait a minute, before I offer them in evidence, I had better offer these photographs.

I wish to offer the photograph of plaintiffs' model of defendant's machine in evidence.

99 By Mr. Ely:

Q. Now, you had better tell us what those are.

The Court: They have not been marked.

Mr. Ely: Yes; we are liable to get them mixed up here.

A. 1472 is the front,—

Mr. Williamson (interrupting): There is no question before the witness.

The Court: We are just getting these photographs marked.

Mr. Williamson: There is no question before the witness.

The Court: No, he is explaining the pictures.

By Mr. Ely:

Q. All right, Number 1472.

A. That is a front view of the Snow model.

Q. That will be Plaintiff's Exhibit 10.

(Document marked Plaintiff's Exhibit 10 for identification by the reporter.)

A. Number 1471 is an angle view of the same machine.

By Mr. Ely:

Q. And that will be Plaintiff's Exhibit 10-A.

(Document marked Plaintiff's Exhibit 10-A for identification by the reporter.)

A. Number 1473 is a view of the Snow model with the front removed.

By Mr. Ely:

Q. That will be Plaintiff's Exhibit 10-B.

(Document marked Plaintiff's Exhibit 10-B for identification by the reporter.)

100 A. Number 1474 is the side of the corridor of the Snow model.

By Mr. Ely:

Q. That will be Plaintiff's Exhibit 10-C.

(Document marked Plaintiff's Exhibit 10-C for identification by the reporter.)

A. Number 1460 is the side of the Snow incubator or model, with the trays taken out, so as to show the sides.

By Mr. Ely:

Q. That will be Plaintiff's Exhibit 10-D.

(Document marked Plaintiff's Exhibit 10-D for identification by the reporter.)

A. Number 1458 is a detailed view of the hatching rack of the Snow model.

By Mr. Ely:

Q. That will be Plaintiff's Exhibit 10-E.

(Document marked Plaintiff's Exhibit 10-E for identification by the reporter.)

Mr. Ely: I offer these photographs of the plaintiff's model of the defendant's machine in evidence.

Mr. Williamson: We object to these photographs as incompetent, calling for secondary evidence, and is also immaterial to any issue in this case.

The Court: You don't offer any of these photographs, do you, these others; some of them are not marked?

The Witness: That is a different machine, Your Honor.

Mr. Ely: Yes, that is a different machine.

The Court: Oh, yes.

The Court: The objection will be overruled.

Mr. Williamson: Exception.

Mr. Ely: I offer as Defendant's Exhibit 11, the photograph of the Robbins machine, held to be an infringement in the California litigation.

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Mr. Williamson: Now, if Your Honor please, I certainly object to them as incompetent and immaterial. It is not the best evidence. The litigation in that suit is not set up in the bill of complaint. The record is not here, and is not introduced in evidence. And if that kind of evidence is admissible here from that suit, we will have to put in similar evidence as to all of these other suits, where the courts have held that there would be no infringement.

The Court: Well, I believe the reason that they are offering these is because the witness has testified that these fans are similar to your fans.

Mr. Ely: Yes; we have the same thing there, Your Honor.

Mr. Williamson: They have not proved that they were in existence before ours, or anything of that kind. I don't see on what point they can possibly be material.

The Court: Well, if the Court has considered that, and shown what they thought of it, they may have some bearing here; I don't know.

Mr. Williamson: Then, if Your Honor please, we would need the whole record in that case, to determine as to whether it is pertinent or not.

The Court: Well, the objection is overruled.

102

Mr. Williamson: Exception.

By Mr. Ely:

Q. Now Mr. Taggart, did you prepare some scale drawings of this model of the Snow machine?

A. Yes, sir,

Q. Showing the air currents?

A. Yes, sir.

(Document marked Plaintiff's Exhibit 11 for identification by the reporter.)

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Q. Let me ask you first, those drawings were prepared by you, were they? A. Yes, sir.

Q. Do they correctly illustrate the model that you made?

A. They do.

Q. And how closely do they follow the machine you saw at Sleepy Eye?

A. The inside dimensions, and all dimensions are as nearly related as we can make.

Q. Now will you go ahead.

Mr. Williamson: We object to any testimony of these drawings, especially as they are marked with arrows, supposed to show air circulation. We have not been invited to see any model of that machine. We don't know whether it is really ours or not. It is purely ex parte. It is certainly improper to introduce these illustrations of that machine without giving us a chance to make tests of it and so forth.

The Court: That is the main question I have ruled on before. The objection is overruled.

Mr. Williamson: Exception.

Q. Now will you go ahead, Mr. Taggart, please.

A. The front or first sheet here is—represents a sectional view across the machine approximately three feet from the front. In this diagramatic section we have left out
104 some unimportant details because it would only tend to confuse. We have the twelve trays in what would represent the turning position, and the two hatching trays at the bottom. We have the fans on each side behind the columns of trays. The air inlets are in the side walls at the rear of the fans. The exhaust is in the ceiling immediately above the corridor. The black marks on each side of the corridor near the top represent the beams which are there to support the front of the trays and the horizontal marks there represent pans that were in there for the purpose of catching condensation of the steam coils and cooling coils that were in the machine. Now in studying this machine I relied on anemometers,—paper ribbons and smoke for determining the direction of the air currents, and then I relied on anemometers, for the purpose of determining the appropriate speed, the lineal feet per minute. With a fan of this type, rotating counter clock-wise as shown on the sheet AA, as I have it, that would be the next sheet that is taken in the plane AA of the first sheet which would be through the fan on the left hand side. Plane AA, through there to the second sheet, shows the fans in AA or would correspond to the photograph which you saw of the fans a while ago. Now the fans were turning counter-clockwise at a speed of 208 to 210 R. P. M.

The Court: You mean by that one turning one way and one the other?

The Witness: No, they were both turning counter-clockwise. Instead of turning to the right, that would be the same

as a clock, they both turned to the left at the top,
105 or counter-clockwise. They were both turning the same way. Now this type of a fan, with the blade set at an angle of 45 degrees, your first thought would be that that would throw the air, push the air out forward. They would if they were placed out in the open, but as they are placed here, within an inch and a half of the wall, they cannot feed from behind. That is no air can get to them from behind, so in their operation they throw the air off centrifugally. As they go around they throw it off centrifugally and we find that the arrows here around the outside of the fans show the direction of the air as it is thrown off from the fans. Now, throwing the air off there, the fan must feed. That is, no fan can throw air unless it feeds from some place and these fans feed almost entirely from the front. That is the air flows into them in the front, flows into them, is thrown out centrifugally from the fans.

The Court: Thrown into them from the inside of the—

The Witness: From among the trays, as you would see in turning back to the—

The Court: From these trays?

The Witness: Yes, sir. It is drawn in over the trays into the fan and then thrown out centrifugally. Now they have a tendency to follow a straight line or a tangent as they are thrown off, but they come in contact with the ceiling, floor and side walls. These walls bend the currents
106 toward the front. There is only one way that they can go, so they flow out towards the corridor, as is shown in the first page. Along the ceiling there is an outward movement; along the floor there is an outward movement. There is also an outward movement along the side walls. Just the opposite way from the way you showed me.

The Court: Yes, I see.

The Witness: Now, in making this study, I have made accurate studies of each of the planes as shown here, that is AA, BB, CC, DD and then, running across the other way in the plane EE, at the top, and then FF, GG, HH, JJ, and KK. In other words I have tested the air movements in each of those planes and the results of those tests are in the attached drawings.

Q. What do the figures by the arrows mean, Mr. Taggart?
A. The figures by the arrows show the approximate speed in lineal feet per minute of the air currents at that point as

recorded by a Biram anemometer. The anemometers that I used in practically all this work were of the three inch Biram anemometers that are accurate, are approximately accurate at 500 feet per minute. As they are placed in an air current they record by a dial here, the speed. I would use a stop watch on them and get the speed per minute. In a large portion of readings here I relied on one-half minute readings after they were in operation. I might say t at in this work I made considerably over 1500 anemometer readings.

107 Now these anemometers don't—all they record, general direction, and when studied and worked with you can get the exact direction and you can also get the approximate speed in lineal feet. There is a slight correction for these on lower speeds, and a correction on higher speeds also, but this is from only—only varies from zero up to 40 feet per minute. And in making these tests I did not bother to make the correction, so the speeds as recorded here are the approximate speeds without the corrections that are necessary to get the accurate speeds.

Now if you will turn to sheet BB, which would be the third sheet, you will note there a view or a sectional view of the side of the corridor and you have the trays, the position of the trays. You have the position of the fans. Now each of those circles represent a place in which the anemometer was put in making these studies. The minus sign means that the air is flowing away from the fans or is being impelled outward by the fans. The plus signs mean that the air is moving in towards the fans. If there is a plus and a minus joined in the circle, as there are in a few places, it means that when the anemometer is placed in that position it does not run steadily in one direction, it may reverse itself or it may not even run at all. The numbers by the sides of these anemometer locations give the approximate speed per minute, as recorded by the anemometer. Now in this section BB, the anemometers were all placed in the plane of the fan and approximately six inches in front of the fans. There is
108 a slight correction to that statement, all placed in the plane of the fans and that is explained in the footnote below. The twelve readings across the top were placed—the anemometer was placed at right angles to the direction of the flow of the air as shown by ribbons. Now, if you will notice that near the eye of the fans the speed of the air going into the fan is from 700 to 800 feet per minute. I noticed one reading here now of 830 feet per minute. Now as you get out further from the eye of the fan the speed of the air flow-

ing into the fan is not quite so strong. Around the top you will notice that those are all minus readings. Along the side walls, these would be the front, the extreme left and the extreme right of the drawing, they are all minus which means that the air is coming out, the fan is throwing the air out centrifugally and it is striking the roof and the side walls and floor and is curving out towards the front. Along the floor you will notice that, with four exceptions, I believe it is four, all of those readings show that the air is coming outward from the fans. Now this reading was repeated or this test was repeated in CC, which is the middle of the trays. It was also repeated in DD, which was at the front of the trays within approximately three inches from the front edge of the trays. It was not right out in the corridor, but about three inches from the front of the trays. Now, to make—if you will notice along the top of DD, reading from the left,
there are two minus and plus and a minus, and then
109 there is a series of pluses, another plus and minus, and
then the others are minus. Now all the minuses are coming from the—the air is coming from the fans to the back of our view here. The pluses are coming from the fans that are on the opposite side of the corridor. At that point the current is carrying from the opposite fans across the corridor and into this tray section.

Now, if you will refer to EE, you will have a diagramatic view of the top of the incubator as though you were looking at it through the roof. If you will remember, we stated the fans were rotating counter-clockwise. In other words in the upper right hand corner the air would be coming up—would be forced up there at a strong speed due to the fact that the fan was turning counter-clockwise. That is in the upper right hand corner.

The Court: Here.

The Witness: Yes. Now that causes a strong current of air to travel out from that corner in the direction as shown by the arrows there. The current, as it leaves the fan section, has a speed of as much as a thousand feet per minute, and that current carries past the center—well past the center of the machine. Now, we have a corresponding thing or situation in the lower left hand corner. The arrows here show the general direction and the approximate speed of the air as thrown by the fans on the roof of the incubator. This air
that comes out, of course must all turn back and go to-
110 wards the fans to be re-circulated in another cycle.
That diagram is exactly the same or almost exactly the same on the two sides of the corridor.

Now in Section FF, which is a horizontal section through the second tray from the top, this is not through the eye of the fan, but it is the condition that I found existing in the second tray from the top. You have—in GG you have the fifth tray from the top. In HH you have the eighth tray from the top, or which is directly through the eye of the fan. Please notice that in those that the air is moving towards the fan, in the trays that are immediately in front of them. Along the two side walls they are moving out, the air is moving out and in the center of the machine by the—in the center column there, the air is moving out. Now the air moves out for a space, turns and goes back towards the fan again, but it flows in continuous cycles and keeps the same speed and the same general direction day in and day out. Now we have the same thing in the line plane JJ, which is the eleventh tray from the top. On the figure KK we have what exists on the floor of the incubator underneath the hatching rack. Those parallel straight lines that lead out from the fans are the metal partitions or dividers between the different hatching trays that support the trays. You will note that they deflect the air current. The air starts out in a certain direction but they turn it. Now this is the condition that exists in the machine constructed after the dimensions of the one at
111 Sleepy Eye.

Q. Now, Mr. Taggart, did you find in the Snow incubator distinct currents of air?

A. Yes, sir.

Q. Did you find—

Mr. Williamson: Object to this as grossly leading, Your Honor, putting right into his mouth what he wants him to say yes to.

The Court: I suppose that is leading.

Mr. Ely: All right.

Q. What is the character of the air current that you find or the current movement of air that you find in the Snow machine?

A. There are direct air currents in practically all of the machines. In the corridor there are numerous places where the air is not in definite form because it becomes a mixing chamber where the air currents come in from the ends and from the top and from the bottom. There there is a curving or mixing before it is drawn back through the trays again and in the corridor you can't say that it is a definite current, but through the egg trays themselves, around the

egg trays and through the air spaces between the egg trays there are definite, definable currents.

Q. Now, Mr. Taggart, how do these currents of air move in the Snow machines?

Mr. Williamson: You mean in your model of the
112 Snow machine, I suppose?

Mr. Ely: All right, I will amend it that way if you like.

A. Along the ceiling and floor of the incubator and along the side walls at the ends of the tray columns the air is coming out from the fan through the mass of eggs that are in the turning racks, the air is largely moving in towards the fan; there are a few exceptions to that, but the general rule is that the air is moving constantly, you might say flowing like the stream, which is the stream of air, flowing in towards the fans continually.

Q. Does it escape? Does the main body of the air?

Mr. Williamson: I didn't hear that.

Q. Does the main body of the air escape or what does it do?

A. There is only a small portion of it escapes constantly.

The Court: That is through these vents on the side?

The Witness: It escapes through the vents in the roof on the Snow. The intake is back of the fans on the sides. The amount of escape is controlled by the amount of intake. The intake can be regulated and of course a corresponding amount escapes.

Q. And then the main body of the air does what?

A. It goes around and around in continuous cycles, moving out from the fans along certain paths, moving in to the fans along certain paths.

Mr. Ely: Now I want to introduce that set of draw-
113 ings that Your Honor has just been looking at.

Mr. Williamson: Those that Taggart has just identified?

Mr. Ely: These are the drawings that Mr. Taggart has just been testifying to, the drawings of the Snow model machine.

The Court: Exhibit what?

Mr. Ely: This is going to be 12, the main drawing is Exhibit 12; 12-AA is section AA; 12-BB is section BB; 12-CC

is section CC; 12-DD and so on, 12-EE and so on, down to 12-KK.

The Witness: There is no II.

Mr. Ely: Oh, isn't there? All right, except there is no II.

The Court: Down to KK.

Mr. Ely: Yes, sir.

Mr. Williamson: Now, Your Honor, the defendant objects to all of these sheets and all of the witness' testimony in regard to them relating to the tests which have been made on the plaintiff's model of defendant's machine, in the first place we object to it as incompetent, as not calling for the best evidence and it not appearing but what the machine itself could be introduced and in the second place we objected to it as immaterial previously for the reason that they were purely ex parte tests to which neither the defendant nor his counsel were invited to be present and ex parte
114 tests have been held over and over again by the courts not to be entitled to any material weight.

The Court: That simply goes to the weight of its credibility. Overruled.

Mr. Williamson: Exception please.

Q. Now, Mr. Taggart, you have some similar drawings which are colored, I believe. What is the purpose of coloring those?

A. I colored certain planes to show—to make it clear in interpreting these. The red indicates air flowing to the fans or towards the fans and the blue, air flowing from the fans, and the white area in between is an area in which the air is either turned back from the blue into the red or else it is an area in which the currents are not definite enough to be classified as either the red or the blue. Now, these—in the tray columns, the entire column on both sides, that is covered red, the air is flowing towards the tray—on towards the fan. In the blue it is flowing away from the fans. Now if you will turn to BB, which is in a plane approximately six inches in front of the fans you can see how large an area —over how large an area the air is flowing towards the fans. The blue shows that the air is coming out along the top and along the bottom, the end walls, and coming out between the two fans due to the manner of the rotation of the fans counter-clockwise it throws that area off of center at

the top and the bottom. You see it is thrown to the
115 left at the top and thrown to the right at the bottom.
Now that is the same as sheet BB in the other drawings, except that it is colored. Now the next one, CC, is the same as CC in the last exhibit except that it is colored. You will note that there is a very close similarity between the two, yet there is some change. The center line now this is in the center of the tray, you understand, half way between the fans and the corridor, and the center line is—has narrowed up somewhat. Now the next one, DD, shows the conditions that are at or near the front of the trays. These readings were taken approximately three inches in from the front of the trays. You will note that the blue line along the right or along the extreme left has become considerably larger and the blue line through the center has faded and has practically faded on the right. There [—] other places along the floor where it is no longer in existence. Now I also have these showing the planes of trays, FF is in the plane of the second tray from the top. The blue shows the air coming out and the red shows it going back into the fan. You will notice that there is—the outcoming arrows are colored blue. There is a space in between that is white and that is where the air is curving back from the blue into the red. That is in an area of just plain mixing. It is a place where the air is turned back. The next set GG shows in the plane of the fifth tray from the top, and here again you find the
same conditions. In the set HH you find there the
116 conditions as they exist at the eye of the fan. That is
the eighth tray from the top. You will notice that over the large area of the fan surface the air is flowing into the fan, and between the fans and at the side of the fans the air is flowing out. Then in JJ we have the conditions as they exist on the eleventh tray from the top, which is repetition of the other drawings. And then in KK you have the conditions as they exist on the floor of the incubator. There the blue represents the air coming away from the fans and the red, the section where the air is definitely flowing back to the fans and the white space represents an area where there is a tendency for a curving of eddying of the air currents.

Mr. Ely: I want to introduce that set of colored drawings.

Mr. Williamson: We make the same objection to these colored drawings as we did the uncolored drawings, Your Honor.

The Court: That will be overruled.

Mr. Williamson: Exception please.

Mr. Ely: Which will be Exhibit 13, 13-BB, 13-CC, 13-DD, 13-FF, 13-GG, 13-HH, 13-JJ, and 13-KK.

Q. Now, Mr. Taggart, what is that that you have just produced here? What is it and what does it show?

The Court: Better mark the Exhibit.

Mr. Ely: That is going to be Exhibit 14.

A. Exhibit 14 is a model made to scale of the Snow model which shows the same conditions as shown in the
117 colored drawings which were just introduced. On the back wall here I show the side of the incubator with the fans in their position, showing the way in which they turn. On the floor I have shown the directions of the colored drawing there, showing the way the air moves out along the floor. The arrow shows the way in which it moves and the color is simply for identification. This plane we put in here corresponds to plane BB. It is in a position next to the back wall or to the side wall of the incubator. The red shows the area over which air is coming out from the fans—

Mr. Ely: Pardon me?

The Witness: Shows the area in which the air is moving towards the fan and the blue shows the area in which the air is coming out.

Q. What does the white show?
A. The white shows the space where the air is turning back into or from the blue into the red. The next plane which is midway between the front and the back of the trays corresponds to plane CC in the other exhibits and in the same way the red shows the area over which the air is flowing into the fan and the blue the area in which the air is coming out from the fan. Now the white again shows the space in which the air is turned back from the blue into the red. The next plane that we put in there showing the conditions near the front of the trays and that corresponds to DD in the other drawings. There again the red
118 shows the area over which the air is flowing into the fan; the blue, the area where it is flowing out, and the red shows the area—or the white shows the area in which the air is turned back from the blue into the red.

The Court: Where would the corridor be?

The Witness: This is the corridor. This is the front of the trays on the opposite side and you would have the same position except that this would be turned around.

The Court: There would be another.

The Witness: Another plane here, and this dotted line on the floor here shows the front edge of the trays on the other side of the corridor.

Q. How do the two sets of trays on either side of the corridor, what is the character of currents in the two sections?
A. As you stand in the corridor and face—this is the side, the currents are, you might say, exactly the same. That is you simply turn from—you just turn around through the corridor on your left hand side and would again show you what we see on the left hand side, on this side.

Mr. Ely: I want to introduce that model, Exhibit 14.

Mr. Williamson: We object to it as incompetent and immaterial to any issue in this case.

The Court: Overruled.

Mr. Williamson: Exception please.

119 Q. Now, Mr. Taggart, what is the difference, or what is the relative velocity, we will put it that way, in volume, of the air in the Snow incubator and in the Smith incubator?
A. In the Smith incubator there are four fans, that is, as put out by Robinson & Myers factory, 16 inch fans. They are supposed to throw fifteen hundred cubic feet of air per minute; that is running free, and if you put resistance in their path you immediately reduce that volume, or, in other words, the four fans, if there was no resistance in their paths, should throw six thousand cubic feet of air per minute, as advertised or sold by the manufacturer. In actual practice in the Smith machine, we find that this volume is reduced somewhat due to the resistance set up by the egg trays and the resistances in the passageway it has to go through. The type of the fan, as shown to us at Sleepy Eye, and as reconstructed by us, will throw six thousand or more cubic feet per minute through the fan, that is, each fan would throw as much or more air, as the four fans in the Smith machine. To compute this, I have taken the area across the front of the fan, or that shown in red here, and used the anemometer, and have found out the number of feet per minute that is flowing into the different fans at the different points of their

surface, and have taken the average of that, and I find it averages considerably over three hundred feet per minute going into the fan,—that is, lineal feet. Now, the surface of the fan is twenty square feet. It is twenty square feet
120 over the surface, and the average air flowing into it is three hundred feet per minute, which means that that fan is moving six thousand cubic feet of air per minute. Each of the four fans will do that. Now, that is measured, not by the out-going air from the fan, but by the air flowing into the fan. You can get the volume of air that a fan moves by testing it from the rear, from the way it feeds, better than you can from the discharge of the fan, because where it is discharged, it is much more turbulent, and it is hard to record. Now, again, in the area, or, again the speed is recorded through the different parts of the trays, and in the air space between the trays, and it shows that in the Snow machine there is three to four times as much air being moved through the Snow machine as there is through the Smith machine.

Q. What effect does that have upon the matter of any curtains, for example?

A. The air is being forced fast enough and in sufficient volume so that it will penetrate all parts of the machine, and there is no necessity for directing or guiding it with curtains or other means; in other words, it flows fast enough to definitely establish its own path.

Q. Now, in the Snow machine, the air, as I understand your testimony, moves in re-cycle paths, is that correct?

Mr. Williamson: That is objected to as leading.

Mr. Ely: I am simply summing up his testimony.

The Court: Overruled. I think he is simply summing
121 up what I have aready heard.

Mr. Williamson: Objected to as leading. You may note an exception.

The Witness: The air moves in continuous cycles and re-cycles.

Q. And what is the condition of the eggs in those cycles of air with respect to the age or stage of incubation?

A. The eggs that are in the paths of these currents are in all stages of incubation, so that the air, as it passes through the tray columns, or around the egg trays, will pick up heat from those in advanced stages of incubation, and carry it to other parts of the machine where eggs are in earlier stages of incubation, and it will keep the temperature substantially uniform throughout the entire chamber.

Q. What effect does this re-cycling of the air have on the Snow machine, in the matter of moisture conservation?

A. It helps to conserve the moisture, as well as to keep uniform temperature.

Q. Just one more question: From where does the air come which moves through the hatching process in the Snow machine, or the trays?

A. Through most of the hatching trays, the air is being propelled upward from the fan,—direct from the fan.

Q. Now, what are the practical advantages of the Smith invention?

Mr. Williamson: That is objected to as immaterial.

122 The Court: I suppose that is one of the main things, to explain to the Court what its advantages are. I suppose that that question goes directly to the very meat of the matter we have got to decide.

Mr. Williamson: I don't think he puts it right.

The Court: Objection overruled.

Mr. Williamson: Exception.

A. The fact that you can have a continuous hatching machine where you can always, by putting your fresh eggs into them, and have large numbers of them in the same machine, and have a temperature equally maintained because of the big reservoir of heat, and the difference in temperature there between the different eggs, the fact that you can do that, you can conserve not only on floor space, but you conserve on the heat necessary for taking care of the incubator. It makes it possible to maintain your heat uniform much better than you can do it otherwise, and it also makes it possible for one man to take care of three to four times as many eggs as he can do in the old style incubator, and it does not require anything like as good a building to put them in, and you do not have to be careful about drafts; also it is a much more efficient machine from the standpoint of economy and of operation, and from the standpoint of labor, and from the standpoint of quality of hatches.

Q. What about the quality of hatches?

A. The percentage of the hatching, of course, varies
123 with the quality of the eggs they place in there, and also the care which the operator gave his machine. We have instances of men operating from five to ten Smith incubators, that will have an average hatch for the season above 75 per cent of all eggs set. It is a safe average to

say that all the Smith incubators out, if given reasonable attention, will average 65 per cent hatching for the season.

Q. How does that compare with the hatches that they used to get in the old days?

Mr. Williamson: That is objected to as incompetent and there is a lack of any proper basis.

The Court: Overruled.

Mr. Williamson: Exception.

A. When I was working with incubators in college, a 50 per cent hatch was considered good, that is, on the average. The old style incubators could produce just as good chicks as those manufactured under the Smith patent, but, they were not uniform; that is, you never knew what you were going to get; it was too much of an art; there wasn't enough science connected with it, and you might get good results and you might get very inferior results and it required more skill on the part of the operator to carry out the process.

Q. Are you familiar with the incubators on the market today? A. Yes, sir.

Q. How did you get familiar with them?

124 Mr. Williamson: I did not get a chance to get in my objection and I move to strike out the answer to the former question and I object to the last question as immaterial.

The Court: I do not know what the last question was.

(Last two questions and the answer read by the reporter.)

The Court: Let it stand.

Mr. Williamson: Exception.

A. It has been my business to keep informed on all new incubators that come on the market, and to keep constantly in touch with the operations of the old incubators.

Q. What percentage of the incubators on the market today are incubators which use the Smith process?

Mr. Williamson: Same objection.

The Court: Same ruling.

Mr. Williamson: Exception.

A. Approximately 75 per cent. That is, you are referring to commercial hatcheries of large size?

Q. Yes, whatever way you want to put it. A. Yes.

Q. Now, just for the sake of comparison with the machine which I will ask the Court to see tomorrow, I wish you would tell me what this drawing is.

A. This is a scale drawing, giving dimensions of the incubator which we saw at Sleepy Eye.

125 The Court: You better mark that so the record may show what he is talking about.

Mr. Ely: That drawing I have just handed the witness I will ask to be marked as Exhibit 15.

Q. What does Exhibit 15 show?

A. It shows a cross section of the incubator which we saw at Sleepy Eye, which was shown to us there, and from which we took measurements. The measurements given there are the recorded measurements that we took at Sleepy Eye.

Mr. Williamson: Do you mean that is a view of the plaintiff's model of the defendant's at Sleepy Eye, his machine?

Mr. Ely: I did not say that.

Mr. Williamson: I would like to know just what it is.

Q. When was that visit to Sleepy Eye?

A. September 29, 1931.

Q. And we took detailed dimensions at that time, did we not?

Mr. Williamson: Objected to as leading.

A. Yes.

Q. Is this drawing a drawing which you prepared from those detailed dimensions which we took? A. Yes, sir.

Q. Did you use those detailed dimensions in the construction of this model you have testified about this afternoon?

A. Yes, sir.

126 Mr. Ely: I offer in evidence, for the sake of comparison with the machine we have, this drawing, as Exhibit 15.

The Court: It may be received.

(At this point a model was marked by the reporter as Plaintiff's Exhibit 14; drawing referred to marked by the reporter for the purpose of identification as Plaintiff's Exhibit 15.)

Q. You told me you wanted to call the Court's attention to something on the Snow advertisement, Exhibit 8. What was that?

A. There are two photographs on those, the photograph on Exhibit 8-B, which shows a corridor view of the machine, or their machine which we saw at Sleepy Eye. The corridor view shows Mr. Snow in the corridor of the machine. If that is not the machine that we saw at Sleepy Eye, it is one very similar to it, from that view. Now, on Exhibit 8, at the bottom of the page we have a photograph, or a cut of a photograph that is labeled, "Snow's incubator", and "designed and patented by E. H. Snow." That is a very good picture of the machine which we saw there and which we had a chance to examine and take measurements of and make tests. I identified it as the same machine because the post that was in front of it that supports the floor above and other things about it are the same.

127 The further testimony of this witness, Joseph I. Taggart, under direct examination, appears on pages 105 to 113, inclusive, of the typewritten record, and are here reproduced in full.

128 November 17, 1932,
At 9:45 A. M.

Court and counsel present.

(By direction of the Court, the Court and counsel and court reporter visited a warehouse on Thirteenth Avenue Northeast, near the foot of Broadway Bridge, Minneapolis, Minnesota, in which there were set up the Smith machine and the plaintiff's model of the Snow machine, and a demonstration was had of these two machines, from 9:45 to 10:15.)

(Returned to the court room at 10:30 a. m.)

Joseph I. Taggart, recalled, testified as follows:

Direct Examination (Continued).

By Mr. Ely:

Q. Now, Mr. Taggart, we have just returned from the demonstration at the warehouse, where you displayed the Smith incubator and the model of the Snow machine. Now, how do those tests compare with your data that you have already given?

A. The tests that we made demonstrated that the record as shown in the data was correct.

Q. And how did the air move in the Snow machine?

Mr. Williamson: What machine are you talking about?

Mr. Ely: The Snow machine that we saw at the warehouse.

A. The air had moved in current form from the fans out along the ceiling, and walls and floor, and then would flow to the fans in current form over a large portion of the
129 fan area. There were other places where the air was turned back from the out-going current, from the fans to the current that was flowing to the fans.

Mr. Williamson: I think that the particular machine that he is referring to ought to be made distinct, as to whether it is the Smith machine or the model of our machine.

By Mr. Ely:

Q. The machine that you have just referred to is what machine, Mr. Taggart?

A. The model of the Snow machine, as we called it.

Q. Now, was it possible for you to determine those currents?

A. Yes, sir.

Q. And could you plot that current movement?

A. It could be plotted, yes.

Q. Could you determine its velocity?

A. Yes, sir.

Q. Was the current movement identifiable?

A. Yes, sir.

Q. Was it in a constant direction?

A. Yes, sir.

Q. Now, Mr. Taggart, I notice in reading over the transcript of the record of yesterday's proceedings that the stenographer apparently misunderstood you in your answer to the question: "Question: Now, what about the speeds of the four fans in this machine down at the Flour Exchange?"—
That is the machine that was exhibited to us in the
130 Flour Exchange as the Snow machine. That is on page 55 of the record. The answer is, as we have it down here: "In the machine down here they varied from 180 some to 120 some,—I have forgotten the exact numbers, but the average speed was only 201 RPM." Now, will you refer to the record,—

Mr. Williamson (Interrupting): That is objected to as grossly leading this witness, and telling this witness that his answer was not correctly taken down, and so forth. He ought to be asked whether his answer is correct.

The Court: Well, the witness can say what he has to say about that answer.

Mr. Williamson: Exception.

A. This record here has "120 some;" it should have been "220 some." The average given there is correct.

By Mr. Ely:

Q. Well, you have the exact speeds, haven't you, at this time?

A. Yes, sir.

Q. Now, will you give us what they are?

A. May I refer to the records?

Mr. Williamson: If the witness is going to refer to notes, we ask that they be introduced in evidence. If he is going to refresh his recollection from the notes, I submit that the notes should be offered in evidence.

By Mr. Ely:

Q. Are you refreshing your recollection from those notes?

A. Yes, sir.

131 Q. Well, will you go ahead?

The Court: Of course, they have a right to inspect the notes, and to offer them in evidence.

By Mr. Ely:

Q. All right. Have you your notes there?

A. I just simply have a notation taken down here, which I copied from the chart that I made at the warehouse.

Mr. Williamson: Well, let it go; no objection.

Mr. Ely: All right.

A. On the four motors of the Snow incubator, or the four fans of the Snow incubator, as shown down here, which is exhibited at the Flour Exchange, on the right hand side,—

Mr. Williamson (interrupting): Which one are you talking about now?

A. The Snow incubator at the Flour Exchange. A test was run there on Monday of this week. The front fan on the right hand side, at 225 RPM, and the rear fan on the right hand side at 190 RPM. On the left hand side, the front fan was 204 RPM, and the rear fan was 184 RPM.

By Mr. Ely:

Q. Now, what was the speed of the fans on the Snow machine that you saw at Sleepy Eye?

A. On the right hand side the front fan was 210, and the rear fan 208. On the left hand side the front fan was 217, and the rear fan 208.

Q. Now, what was the speed of the fans in the machine that we just saw demonstrated, the plaintiff's model of the Snow machine?

132 A. I will have to give that from memory. I do not have those records right here with me.

By the Court:

Q. You made a note of it at the time?

A. Yes, sir.

By Mr. Ely:

Q. I have them here; they are on one of those drawings, on the back of it—right there (indicating).

A. On the left hand side,—

Q. (interrupting): No, pardon me; this is it right here, "RT?"

A. On the right hand side, as you face the machine, the front fan was 209, and the rear fan 207 RPM. On the left side, the fan was 205, and the fear fan was 208 RPM.

Q. Now, you tested the speed of the fans in the Smith machine there?

A. Yes, sir.

Q. What was the speed of those four fans?

Mr. Williamson: You mean, the one we saw this morning?

Mr. Ely: Yes.

A. The front fan was 1664; the second fan was 1648; the third fan was 1689, and the rear fan was 1667.

Q. And do you know the diameter of the fans?

A. They are 16 inch fans.

Q. Now, in the test of the Snow machine, from which we have just come,—

Mr. Williamson (interrupting): You mean, the model?

133 By Mr. Ely:

Q. Yes, the model from which we have just come, how was the current of air flowing underneath the hatching tray?

A. At the back of the hatching trays, it was flowing out from the fan at all points, although we did not make that test this morning, but at the front of the trays, it was flowing out at part of the trays, and flowing in at part of the trays.

Q. How many trays was it flowing out, taking one side,—of one side, how many trays was it flowing out?

A. Well, if you will pardon me, that is shown definitely in the drawings.

Mr. Williamson: Well, that drawing was not made today off of this model.

By Mr. Ely:

Q. How does that drawing compare with what you found today?

A. It checked at every place that we checked it.

Q. Well, then, underneath, how many hatching trays was the current going in on one side?

A. There is only one hatching tray where the in-current was clear across the front of the hatching tray space. There were one, two, three, four others, in which there was an ingoing current at a part of the space. At other parts, it might be stopped, or, on the other side, it might be going out. That is shown in "kk" of both the colored drawings and the plain drawings.

Q. Do you know where that current was coming from
134 that was flowing into the hatching trays?

A. It was coming from across the floor of the corridor.

Q. From the fan?

A. From the fan on the opposite side.

Q. Now, there is just one other thing that I want to ask you about, and that is in regard to something that was brought up on the matter of the patent in suit.

Will you please show to the Court what the patent in suit, —what reference there is in the patent in suit to the flaps between the columns of egg trays; those are the flaps which are designated "28."

Mr. Williamson: Now, we repeat our objection to this question, and to any question along this line put to the witness on the ground of incompetency, this witness not having qualified as a patent expert. We made that objection when the first question was put to him, where he was asked to explain the machine of this patent. He is not qualified as a patent expert, and we object to it as incompetent.

The Court: The objection will be overruled.

Mr. Williamson: Exception.

The Court: Now, will you read the question, Mr. Reporter?

(Previous question read by the reporter.)

By the Court:

Q. Where are you referring to?

A. If you will refer first to the figure "3", please?

Q. All right.

135 A. If you will notice the turning racks,—at the bottom of the turning racks here (indicating), Your Hon-

or, right at the bottom there is a connecting flap that goes from the bottom of one column.

Q. Oh; here it is; I see it (indicating).

A. Yes, sir, right there (indicating); it connects this column (indicating).

Q. Yes.

A. That flap is connected to the bottom of each of the trays, for the purpose of making the air go through those particular trays.

This is referred to first on page two, at line 28. You are on page one of the printed subject, Your Honor. On page two, line 28, it states: "As explained later, the trays near the bottom are preferably arranged so that the air is forced to pass between the eggs in each tray, thereby cooling or holding the temperature of those eggs down."

Now, again, in line 56, in the same column, it states: "and it will be also noted that the vertical spaces 27 between the adjacent tilting racks 10 are closed at their lower end by flexible strips of fabric, which are attached to and extend upward at each side of each rack, so as to compel the air to circulate through the mesh bottoms and around and about each tray as heretofore referred to."

Q. You have got it "egg" here.

A. Yes; "and around and about each egg as heretofore referred to."

136 By Mr. Ely:

Q. That is, the Patent says that those are preferably used, is that correct?

A. Yes, sir.

Mr. Williamson: Where does it say the word "preferably,"—where is that?

The Witness: On line 29.

Mr. Ely: On line 29, right there (indicating).

By Mr. Ely:

Q. Now, in your Smith incubators, do you use any such device?

A. No, sir.

Mr. Williamson: That is, in the commercial machine, I suppose?

Mr. Ely: I said the Smith incubator.

By Mr. Ely:

Q. Now, Mr. Taggart, one other question: In the Patent in suit, are the trays capable of being moved,—are the egg trays capable of being moved in and out of the hangers individually?

A. Yes, sir.

Q. And that is the way they are used in the Buckeye machine, is that correct?

A. Yes, sir.

Mr. Ely: You may cross-examine.

137 Joseph I. Taggart, under Cross-Examination (pp. 114-2nd line p. 142).

Taggart repeats that he is Assistant General Manager of the Smith Incubator Company and has occupied that position for approximately four years, but had been with the Smith Standard Company from the fall of 1923 to 1927, but, at the same time, did work for the Smith Incubator Company. Practically has been working for the Smith Incubator Company for the last ten years. Thinks the Smith Standard Company was a corporation, but if so does not know whether it is dissolved or not, but it quit operation in 1927. Says it was a hatchery and that Dr. Smith owned or controlled the Smith Standard Company and also the Smith Incubator Company. Understands that the Smith Incubator Company is a corporation. Thinks organized under the laws of Ohio, but is not certain, and don't know how long the Smith Incubator Company has been organized. Says it is Dr. Smith's personal business. Says there is also a Smith Incubator Manufacturing Company, and that Dr. Samuel B. Smith, the plaintiff, is the controlling stockholder in both of these concerns, but Taggart can't tell which one writes his checks. Says he does not own any stock in either of said two corporations. States that his remuneration, as Assistant Manager of the Smith Incubator Company, consists of a salary and a percentage of the net profits, and this has been the situation for the past four or five years. Says he, himself, has no interest in the title to the Smith patent in suit. Does not know whether the Smith Incubator Company has any interest therein or not. However, that may be, Smith controls the busi-
138 ness of the Smith Incubator Company. Says the Smith Incubator Company is not directly interested in the proceeds of litigation under the Smith patent, and that the legal title stands in Dr. Smith's name. States that in earlier recoveries for profits and damages in infringement suits, the Buckeye Incubator Company received the same, but in later

cases, Dr. Smith gets such recoveries, but the Smith Incubator Company got the benefit of the said litigation from its sale of incubators. He repeats that he, Taggart, gets a percentage of the net profits of the Smith Incubator Company and that this had been the situation for approximately five years. Says the Buckeye Incubator Company, formerly of Springfield, Ohio, is exclusive licensee under the Smith patent, on a royalty basis and that these royalties are payable to Smith personally. States that he is not a lawyer and has never studied patent law, except as associated with the incubator business, and only claims to be a patent expert insofar as incubators are concerned. He has testified in perhaps a half dozen cases as a patent expert. He states that he has not read the Statutes to a sufficient extent to know the distinction between the disclosure made by the drawings and specifications proper of a patent and the claims of a patent.

In his testimony as to the disclosure of the Smith patent, he had confined his attention to the specification proper, including the drawings, but did not undertake to "explain the claims at all." Being asked whether he had read the file wrapper record of the Smith patent in suit, he answered that he'd done so in the past, but not lately. Says he is not sure that he could give definite answers relating to all parts of the file wrapper record of that patent, but had gone over it and studied it out. Then being asked whether he took
139 that file wrapper record into consideration in forming his theory of the disclosure of the Smith patent that he had stated to the Court, he replied that he could not give any definite answer to that question. Then, being asked whether he had considered any or all of the prior patents cited on that file wrapper record of the Smith patent in suit, he answered that he had considered all of them "in the past", and took them into consideration in forming his theory of the disclosure of the Smith patent, but he admits that he had not studied any of these patents recently before he took the stand in this case. Under direct examination, he had testified to the effect that the machine of the Smith patent was capable of being used successfully without the presence of the curtains in the corridor of the machine. And then being asked whether he found in the Smith patent any statement to that effect, he answered "Yes, sir", and called attention to the sentence beginning in line 73 of page 2 of the patent.

Then, the further proceedings on pages 125 and 126 of the typewritten trial record were as follows:

"Q. Point it out.

A. On page 2 of the descriptive matter, line 73.

Q. Line 73?

A. 'It is obvious that the fans can be so arranged and can be operated at such speed as to cause the hot air to circulate fast enough to keep the temperature throughout the chamber between the limits of 100 and 105'.

Q. It don't say without curtains, though, does it?

A. It simply says that you can drive the fans fast enough to circulate the air. It makes no mention of curtains whatever.

Q. It makes no mention of curtains whatever. It does mention the curtains at other places in the specification, does it not?

A. They are described in the preferred apparatus that Smith has set up.

Q. And in the described operation set forth in that patent it is set forth with reference to the machine which has the curtains on, is it not?

140 A. The preferred apparatus, as shown there, has curtains, yes, sir.

Q. And he does not illustrate or describe any modified apparatus, does he?

A. It is not customary, no, sir.

Q. Never mind that. Answer my question. The patent doesn't show any modification, does it?

A. He only describes one preferred apparatus.

Q. No modification?

A. I have stated he only describes one preferred apparatus."

Taggart specifically stated that in the commercial incubators, made and sold by the Smith Incubator Company, curtains were always present, and, in the incubators sold by the Buckeye Incubator Company, partitions serving the same purpose as the curtains, were present in all incubators sold. His attention having been called to the length of the curtains in the vertical plane, Taggart stated that the curtains as used on the commercial machines, put out by the Smith Incubator Company, were somewhat shorter than those shown in the Smith patent, varying from 2½ to 5½ or 6 inches from the top of the hatching tray, and that the partitions used for the same purpose in the incubator made and sold by the Buckeye Incubator Company, have varied from time to time, but as a general rule, the lower ends of said partitions came just about to the top of the hatching trays. He states that on direct examination, he had made a statement to the effect that, under the disclosure of the Smith patent, the air might

be circulated in any suitable way. Being asked whether anything to that effect was said in the Smith patent, his answer was "yes, sir", and then being asked where, he said "In the claims", but stated that he was not a patent expert in respect to the claims of the patent. Then, being asked whether he could find anything in the drawings or specifications of the Smith patent in suit, to indicate that the air might be
141 circulated in any way, he again calls attention to the sentence beginning in line 73 on page 2 of the patent, which he had referred to and quoted in a previous answer.

He stated that the word "agitation" is not anywhere used in the specification of the Smith patent. Says that, in his explanation of the Smith patent to the Court, he did not talk about his own experience with incubators. He repeats that, in his explanation of the Smith patent to the Court, he told the Court that the curtains could be dispensed with. Being asked on what he based that statement, he says that the patent states that the air must be circulated with sufficient speed to keep the temperature uniform throughout, and that curtains are not necessary for that purpose.

He stated that the Smith patent did not anywhere say either that the curtains were not necessary or that they were necessary. Then the next five questions and their answers, appearing on pages 130 and 131 of the typewritten record, read as follows:—

"Q. But the method which he sets forth in there is partially effected, that is the method of air circulation, which he sets forth in the patent, is largely affected by the curtains, is it not?

A. In the preferred apparatus, yes.

Q. Yes. Thank you. And that air, as he describes it in the patent is forced down from the top by those fans in the columns, is it not? A. In the preferred apparatus, yes, sir.

Q. And it goes down to near the bottom of the machine, a large part of it striking the floor and is then deflected in under the columns of trays, that is true, is it not, beneath the lower edges of the curtains, that is right, is it not?

A. Yes, sir.

142 "Q. Then it goes up along the trays and through the trays to the gallery at the top or each of the galleries at the top above the tiers of trays and then back over to the fans, does it not?

A. Yes, sir.

Q. And then is re-forced again down the column from the corridor and repeats that over and over again, that is right, isn't it? A. Yes, sir."

He states that, under direct examination, he had testified to the effect that he was familiar with incubators as they were used in this country prior to the appearance of the incubator of the Smith patent, and states that those which were successful, so far as known to him, only had one tray or pair of trays—egg trays—located on a common level.

The next question put to the witness at the top of page 132, of the typewritten trial record, and its answer, read as follows:—

"Q. That is all you saw. You don't mean to say that there were not other kinds of incubators in use, do you?

A. Well, I made a study to try to find others, and I have never found one that was commercially a success. I have found some that they tried to use commercially, but I did not find any that were in commercial operation or successfully operated. The standard type of an incubator that was in use prior to the Smith invention, the eggs were arranged at one level."

He states that there have been incubators shown in prior patents and publications, with egg trays arranged on more than one level, and wherein the incubators were heated to uniform temperature under thermostatic control, but says that Smith was the first "to combine staged incubation where the eggs were arranged at different levels and employed forced draft." Says there were plenty of cases where they tried to hatch at different levels, but that, so far as he knew, none of them were successful.

143 His attention being called to that part of his testimony under direct examination, wherein he had said that Smith was the first to use the heat of the hatching chickens, after the chickens come to life, to supply some of the heat for hatching other chickens in the incubator, he made the following further statement, to-wit:—

"He (Smith) certainly was the first to perfect a means whereby it could be carried out, where the temperature was kept uniform throughout the chamber."

Then, being shown a copy of the U. S. patent to Zimmer, 1,075,747, of October 14, 1930, he stated that he had read the same, and that this Zimmer patent did disclose an incubator, wherein the eggs were set at different times with feather mats between them, and wherein the heat of the hatching eggs, earlier set, was utilized to help hatch the eggs in the later stages of incubation, but says that the temperature

within the cabinet was not uniform and that that Zimmer type of incubator had not been successful. Then, having been shown a certified copy of the German patent to Stulik, No. 155,917, of November 7, 1901, and a certified official English translation of that German patent, and asked whether he had read it and understood it, he testified as follows:—

"Q. Do you understand it?

A. Yes, sir. In this Stulik patent it shows staged incubation with the hottest eggs always in the top of the column and the ventilation comes in from the bottom and goes up through the incubator and out at the top, escaping entirely to the outside. So that any heat generated would pass on out. The coolest eggs are always at the bottom, as described in the Stulik patent.

Q. But he did get the benefit of the heat from the eggs in the last stage of incubation on the others?

A. You absolutely would get no benefit from them whatever.

Q. That is your statement, is it?

A. (No answer)."

144 Says that he graduated from the Ohio Wesleyan University securing the degree of bachelor of science; and that while attending this institution he took the general cultural course—regular academic course—but specialized in zoology. Says he does not claim to be a mechanical engineer. States that he never took any general course of training in heating or ventilating, but, that when in college, he had a course in physics and has done more or less work in heating and ventilation connected with incubators and hatcheries.

Then the said witness Taggart's further testimony, under cross-examination, pages 139 to the top of page 142, and his further testimony under re-direct examination, pages 142 to 148, inclusive, of the typewritten record are as follows:—

145 Q. Having regard to the specimen of the Smith machine, which you and Mr. Ely showed to the Court, in the presence of counsel for the defendant, and Mr. Rowley, this morning, you put in certain tabulated sheets and gave testimony as to the action of the Smith machine, did you not, on direct examination?

A. That is the air currents in the Smith machine?

Q. Yes.

A. Yes, sir.

Q. Now, when you made those tests with that specimen of the Smith machine, which tests you tabulated and introduced into evidence, was the machine then in the same condition that it is now over here in the warehouse, and as it was shown to the Court this morning?

A. Yes, sir, with the addition that the heating pipes and things of that kind were connected,—the heating plant was not connected with this one this morning; that is the difference.

Q. The moisture supply, and so forth, was that all connected, too? A. Yes, sir.

146 Q. Well, were the trays all in and the curtains in use at the time you made the tests, which you tabulated and introduced into evidence, with that Smith machine?

A. Yes, sir.

Q. You also showed to the Court, in the presence of counsel for the defendant this morning, in the same building, the plaintiff's model of what has been referred to in the plaintiff's testimony as the plaintiff's model of the defendant's machine, did you not? A. Yes, sir.

Q. You have identified and introduced tabulated sheets, and have given testimony regarding certain tests you made of that machine, have you not? A. Yes.

Q. At the time you made the said tests of the plaintiff's model of the defendant's machine, was the machine then in the same condition that it was today when you showed it to the Court? A. Yes, sir.

Q. Where did you make those tests?

A. They were made in Cleveland, Ohio.

Q. When?

A. At various times; some of them were made last spring and others this fall, and late summer.

Q. Neither the defendant nor his counsel were asked or given opportunity to see those tests, were they?

147 A. No, sir.

Q. At the time that you tabulated the tests that you made of the plaintiff's model of the defendant's machine, were the trays all in position at the time of all the tests, just like you showed it to the Court this morning?

A. Yes, sir. I might add that sometimes the trays were tilted in the opposite position, but the trays were all in and all in operating position.

Q. Were the tiers of trays, or any of them, taken out at any time when you made those tests, of which you have made tabulations and introduced them here?

A. There were times in making tests along the back wall, where the fan is operating, that I pushed the trays

aside, and stood up on the hatching racks back in there, to get the anemometers in position, but the trays were all in position when all the other tests were made, and practically all the tests on the back wall,—I would not say about all of them, but practically all of them.

Q. In some instances, some of the trays may have been removed?

A. In some instances, when I was checking on the back wall, where the fans are, they may have been,—I couldn't say positively about that.

Q. In respect to your tests of the said Smith machine which you showed the Court this morning, were the curtains always on in the same position when you used
148 them for hatching, as when you made those tests?

A. Yes, sir.

Mr. Williamson: That is all.

Redirect Examination.

By Mr. Ely:

Mr. Ely: I think I might as well introduce those two machines in evidence which we tried out this morning, and I will introduce the Smith machine as Plaintiff's Exhibit 16, and as Plaintiff's Exhibit 17, the plaintiff's reproduction of the Snow machine.

Mr. Williamson: Don't you call it a model?

Mr. Ely: I am calling it a reproduction when I am introducing it.

Mr. Williamson: We make the same objection to the machines now being offered that we did to the photographs of the machines before. That is objected to as incompetent, and secondary evidence, and not being a machine which the defendant ever actually made.

The Court: Objection overruled. They will be received.

Q. Now, there has been some reference to this Snow machine over there as a model. Is it a full sized working machine? A. Yes, sir.

Q. And the dimensions are accurate, in accordance with the machine which you saw at Sleepy Eye?

A. Yes, sir.

149 Mr. Williamson: That is objected to as leading.

The Court: It is leading, but I will let it stand.

Q. You said something on cross-examination about a license to the Buckeye Company. I don't think you quite

gave a complete answer on that. What is the status of the license that the Buckeye Company operates on?

A. The Buckeye Incubator Company holds an exclusive license to manufacture machines under the Smith Patent, up to sixteen thousand five hundred egg capacity. Dr. Smith reserved to himself the right to manufacture machines of twenty-five thousand capacity and over.

The Court: What about those between sixteen thousand and twenty-five thousand?

The Witness: They mutually agreed that was forbidden territory, and neither one of them would manufacture in that capacity.

Q. Now, Mr. Taggart, on that demonstration of the Smith machine this morning, I don't remember whether I asked you this on direct examination or not, but just so to be sure, did you demonstrate that Smith machine with the curtains pulled back?

A. Yes, sir.

Q. What was your purpose in doing that?

A. To show that there was an upward movement of air between the tray columns and through the trays when the curtains were not there.

150 Q. How did you make that,—pardon me?

A. By anemometers demonstrating that there was an upward current through those columns even clear to the back of the column, and I also demonstrated that the lower part of the turning racks near the corridor, the air would be going down at that particular point, instead of going up, or in other words, the fans do not throw just a shaft of air,—it is like a cone. The fans throw a stream of air that goes out cone-shaped, and as set in that machine, the edges of that cone current strike the front of the trays at about twenty-eight to thirty inches above the floor, so from there down it is going downward, and and then curves up.

Q. What is the relative speed of the upward current in the egg columns, with the curtains over and with the curtains out of the way?

A. It is approximately the same, but in the positions where the anemometer,—the position farthest back where the anemometer is placed, it runs faster.

Q. Runs faster when?

A. When the curtains are thrown aside so there are no curtains there.

Q. Now, will you take your copy of the Smith Patent for just a minute. Now, with respect to those curtains, concern-

ing which there has been so much discussion, the Patent shows the curtains down to the top of the hatching tray, is that correct?

151 A. Yes, sir.

Q. And in your commercial machine, where are the lower edges of the curtains?

A. At the present time, we put them five to five and one-half inches above the rail of the hatching rack; that would be about seven inches or a little more above the top hatching tray.

Q. Has anything been done to the fans, or has there been anything done to the velocity or volume of air when this change was made?

Mr. Williamson: That is objected to as immaterial. What is done in a commercial machine is absolutely a matter of indifference.

The Court: Overruled.

Mr. Williamson: Exception.

A. The fans we use in the commercial machine are considerably larger than those represented in the Patent, and we have found that with the larger fans we can get a definite current of air through the eggs, which we have placed at the bottom of the machine with shorter curtains, and we have been following that method for quite sometime.

Q. Now, let us pursue that subject, a little further. Suppose you put them higher, the edges of your curtains, say, ten inches above the hatching tray, what would you do to get the same results?

A. We would get the same results with our present
152 equipment, but, as you would shorten the curtains, if you increase the fan volume sufficiently, you would still have a definite circulation through the hatching trays, or to do the reverse, you can lower the fans,—the fans are placed,—in the Smith, they are placed six feet and two or three inches above the floor, so people can walk in the corridor. If we lowered the fans so as to bring the force of the air nearer the floor, we would not necessarily need any curtains at all.

Q. How would you then get at your trays?

A. That would be a problem with the Smith machine.

Q. How about the Buckeye? How do they get at them?

A. They have doors, or they do not work within the corridor of the machine at all. They have doors on the outside which they open to get at the trays that are in that turning

rack. For example, in the Patent it shows a door on the left hand side of Figure 1.

Q. Suppose we pursue that still further, and put the lower edge of the curtains, say, two feet above the hatching trays so you just have one narrow curtain, what would you do then?

A. You would want more fan velocity.

Q. What about the location of the fans?

A. Well, the fans could be lowered to take up the difference.

Q. Would you get the same circulation of air through the trays?

153 A. Yes, sir.

Q. And so on up until you have an extremely narrow curtain, what then?

A. You would have the same result if you increase your fan volume and velocity accordingly.

Q. Then I understand the curtain could be entirely dispensed with and the Smith process could still be carried on?

Mr. Williamson: That is objected to as incompetent and calling for a conclusion of the witness.

The Court: Well, he is testifying here as an expert.

Objection overruled.

Mr. Williamson: Exception.

A. Yes, sir.

Q. That Stulik German Patent, to which your attention was called, are you familiar with former litigation under this Patent? A. Yes, sir.

Q. Has that Patent been considered in other decisions?

Mr. Williamson: I object to that.

Mr. Ely: The Stulik Patent is mentioned specifically by Judge Wooley in the Hillpot case, as failing to meet the Smith invention.

The Court: You are asking whether it was considered in these decisions. Wouldn't those decisions prove that?

Mr. Ely: Sometimes the Patent has been referred to and sometimes it has not. In the Hillpot case specifically,

154 Judge Wooley referred to the Stulik Patent as the best in the prior art references, and held the Smith Patent valid over it. I suppose I might ask Mr. Taggart this question: Were you present, or have you been present at former trials on this Patent?

The Witness: Yes, sir.

Q. Are you familiar with the art which was set up therein?
A. Yes.
Q. Did you testify with regard to that art? A. Yes.
Q. Did you ever testify in regard to the Stulik Patent in any of that litigation?
A. Yes, sir.
Q. Did you ever testify as to the Zimmer Patent in regard to that litigation? A. Yes, sir.
Q. Do you know whether the Stulik Patent was cited in the Patent Office?
A. I am under the impression it was, but I cannot say positively.

Mr. Ely: I think that is all.

Mr. Williamson: No recross-examination.

(Witness excused.)

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155 HARRY B. PERKINS' Testimony, Under Direct Examination. (In narrative form).

Harry B. Perkins, a witness called on behalf of the plaintiff, being first duly sworn, testified to the following effect:

States that he is sixty-six years of age and resides at 3565 Rocky River Drive, Cleveland, Ohio. Says his occupation now, and for the past eight years, is and has been as Secretary of the Smith Incubator Company. Says he has charge of the accounting at the Smith Incubator Company, including records of the machines sold by that company, and also sold by the licensee, the Buckeye Incubator Company. Says that he has compiled from the books of the company, a statement showing the number of incubators manufactured and sold by the Smith Incubator Company and by the Buckeye Company. Says it would not be feasible to bring the books and records to the place of trial. The witness' testimony and the said compilation referred to by him, were objected to as incompetent, but were admitted by the Court on the understanding that the books would be produced and made available to the inspection of defendant's counsel, and also subject to a ruling to be made by the Court in his decision. This ruling, however, was not made in the trial court's decision. Defendants' counsel offered to admit that "the Smith incubators had been in very extensive use". The witness was then allowed to proceed, and he stated that the records covered the gross sales of the forced draft incubators sold by the Smith Incubator Company and by the Buckeye Incubator Manufacturing

Company. That the tabulations regarding the sales of
156 the Smith Incubator Company were prepared under his supervision from the books of that Company, but that he, himself, did not keep the said books. Regarding the tabulations from the Buckeye Incubator Company, he says those were prepared from royalty statements rendered by the Buckeye Incubator Company to the Smith Incubator Company. Says that in the period from 1922 to October 31, 1932, the Smith Incubator Company manufactured 1885 Smith incubators with a total egg capacity of 90,090,000, and that the money value thereof was $12,213,084.25. Says that the Buckeye Incubator Company paid to the Smith Company royalties on 10,228 machines, having an egg capacity of 98,247,728, and that the value in money was $11,726,987.56, and that the total number of machines made by the two concerns was 12,113, having an egg capacity of 188,337,728, eggs, and a money value of $23,940,071.81.

The witness then produced and identified orders received from the defendant, E. H. Snow, for Smith incubators, the first thereof having been dated November 7, 1924, for a single incubator, and the second June 13, 1925, another order was dated April 1, 1926, and two were dated June 2, 1926, three on June 15, 1926, another on June 15, 1927, and another on September 10, 1928, a total of twelve incubators.

Says each of said incubators had a capacity of 47,000, and that $72,102.00 was paid by said Snow for said Smith machines.

The contract of June 13, 1925, between the Smith Incubator Company and E. H. Snow was produced and identified by the witness and offered and received in evidence, on behalf of the plaintiff, and marked "Plaintiff's Exhibit 18".

157 The tabulation sheet, identified by this witness, Harry B. Perkins, was offered and received in evidence and marked "Plaintiff's Exhibit 19".

Harry B. Perkins' Testimony, Under Cross-Examination.

The witness states that he did not, himself, keep the books or make any of the entries from which his tabulated reports of the Smith Incubator Company were prepared. He also states that he did not make the royalty returns of the Buckeye Incubator Company and did not keep any of the books from which those returns were made.

Then the following further proceedings were had as shown by page 163 of the typewritten record, here reproduced in full, beginning with line 4 thereof, to-wit:

"Mr. Ely: Now, if your Honor please, Mr. Williamson made the statement that Mr. Snow had made a machine long before he purchased any Smith machines. I will ask Mr. Williamson if he will identify this letter.

The Court: Just a moment. That is not in evidence.

Mr. Ely: No, no, but I am asking Mr. Williamson if he will identify this as a letter of Mr. Snow, that I wish to put in evidence.

(Document submitted to Mr. Williamson).

Mr. Williamson: I have never seen this letter before; I don't know whether it is a letter from Mr. Snow or not.

(Document submitted to Mr. Snow by Mr. Ely).

Mr. Williamson: It will be time enough to ask him that when he is on the stand, I should think.

The Court: Well, your answer is sufficient.

Mr. Williamson: If he does not recognize the letter, he can say that he does not recognize it.

Mr. Snow: I don't remember that.

Mr. Ely: Will you take the stand, Mr. Snow, please?"

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158 EARL H. SNOW'S Testimony, Under Direct Examination. (In narrative form)

Earl H. Snow, a witness called on behalf of the plaintiff, being first duly sworn, testified to the following effect:

That he is the defendant in this case, Being shown a letter, dated October 30, 1924, he stated that it was his letter. Does not know whether he received a reply to that letter or not. Says he has no recollection of receiving such a reply. His letter of October 30, 1924, was then offered and received in evidence and marked "Plaintiff's Exhibit 20". Then a letter from the Smith Incubator Company to Mr. Snow, dated November 4, 1924, was marked for identification as "Plaintiff's Exhibit 21", but it was not there offered in evidence.

JOSEPH I. TAGGART'S Testimony. (Recalled).

States that all of the Smith Incubator Company's incubators sold were marked with the word "Patented", and that there is such a mark on the incubator, previously introduced on behalf of the plaintiff.

Then being asked to state whether he knew where the copy of a letter came from, he answered that "It came from the general files of our office in Cleveland". Then this carbon copy of that letter was offered and received in evidence and marked as "Plaintiff's Exhibit 21".

Then plaintiff's counsel, Mr. Ely, stated on the record, on page 167, that the plaintiff rests.

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159 Defendant's Case.

SAMUEL B. SMITH's Testimony, Under Direct Examination. (In narrative form).

Samuel B. Smith, the plaintiff in this case, having been called as the adverse party in this suit and examined as a hostile witness in accordance with the Minnesota State Statute, Section 9816, Volume II of Mason's Minnesota Statutes, and U. S. Compiled Statutes, Section 1464, testified to the following effect:

That he is the plaintiff in this case. He is sixty-one years of age and resides at 48 Culver Road, Rocky River, Cleveland, Ohio. States that he is the patentee of the Smith patent in suit, 1,262,860, of April 16, 1918. States that he was a witness on behalf of the plaintiff in a prior suit, entitled "Buckeye Incubator Company and S. B. Smith, plaintiffs, vs. Elton E. Cooley, defendants". States that he once lived and had a place of business at Attica, Ohio, which place was about ninety miles from Cleveland. States that he built an incubator at Attica, Ohio, in 1912, and moved it over to Cleveland, Ohio, and there ran the same in the hatching of eggs in the years 1913 and 1914.

Then being asked to describe the structure of that incubator used in the period stated by him, he answered, as follows:

"A. It was built in three compartments or rooms, each one separate, without any connection between them. These compartments were about nine and one-half feet wide, and about twelve feet long, and some were about ten feet
160 high. The heating pipes were on the floor. There was one fan in the center of the ceiling, and then there was a space between the eggs, on each side of it; there were tiers of eggs on each side, eight in number, if I remember rightly,—I will have to think a minute or two, to get the number,—to find out how many tiers high they were. I rather think it was about fourteen."

He then repeated that there were fourteen tiers of eggs, and that the trays of eggs were superimposed, one above the other. That there were two tiers of eggs in a bundle or carrier, and that these carriers or bundles could be revolved so as to turn the eggs. These rooms were all filled with the same age of eggs. Then, being asked to describe fully the action of that incubator, he stated that,

"The air was driven down to the floor by the fan and came up around the eggs and led in between the columns of eggs. A small amount might go through the trays but a majority of it went up around between the columns."

Being further questioned, he stated that there was a corridor between the two rows of trays and that this corridor was much like the one shown in his patent here in suit in respect to size and position, but that there was no curtains in the corridor. Restates that there were never different eggs of different stages in any of the compartments of this incubator, but that all of the eggs were of the same age and set at the same time. Repeats that the eggs were in tiers of superimposed trays with the corridor between the tiers. Says the fan was suspended from the ceiling, and that the heating pipes were on the floor.

Then, being asked how the air got heated and circulated, he said that the heating pipes on the floor would heat the air there and the fans, driving it around these pipes, would make
the air pick up the heat from the pipes, and then it
161 would go to all the tiers of trays going up through and
mostly between the trays and then back to the fan and be recirculated. He states that the motor ran the fan at a speed of 1750 revolutions per minute, and as to temperature that the air was kept at about 100 degrees, under thermostatic control. Says that he did not humidify the air and had but very little ventilation in the incubator. Then the next two questions and the witness' answer thereto are here reproduced in full, to-wit:

"Q. How long did you commercially use that machine at Cleveland, Ohio, in that form that you have described?
A. Two years.
Q. Two years? A. Yes.
Q. And you sold the hatches did you not? A. Yes, sir.
Q. So that was for commercial use, was it not?
A. Yes, sir."

Then, being asked whether that incubator there commercially used by him, operated substantially in the same way as

the machine disclosed in his patent in suit, he answered that it did not. And then, being asked what the difference in action, if any, was and what caused the difference, he replied that

"The pipes, the heating pipes, were changed from the floor to the ceiling; we put in different ages of eggs in this machine".

States that it was in 1915 and 1916 and after 1914 that they had staged incubation.

Then, being asked whether or not the air circulation was not substantially the same in the two machines, his answer was in the negative, and then being asked what the difference was, he answered that he had one fan in 1912 and 1913 and three fans in 1915 and 1916.

162 He states that this machine, used by him in 1913 and 1914, in Cleveland, Ohio, was located in the German Lutheran Church on Madison Avenue, and that he believes the number of that church is 7918. He states again that in said machine, used at that place in 1913 and 1914, he had one fan in each of the compartments and that there were two sets of tiers of trays with a central corridor between the two, and that the fan was at the top of the corridor and the pipes at the bottom, and that the temperature was controlled by a thermostat and that the fan forced the circulation of air. Repeats that he did not use any curtains on that machine.

The next few questions and their answers read as follows:

"Q. How long did you continue to use that machine; you say you used it there in 1913 and 1914; how long did you use it?

A. In 1913 and 1914, we used the machine with the one fan in the center of the ceiling of each compartment.

Q. Oh, of each compartment?

A. Yes, and in 1915, we changed the machine, that is, we changed the inside part of it, without making very much change in the shell. We used it in 1915 and 1916 with three fans in each compartment, and the curtains, and stage incubation. We did not use stage incubation in 1913 and 1914.

Q. What time did you use it in 1915 first?

A. In the hatching season, beginning along about February or March."

Q. But, into that original machine which you brought from Attica in 1914 and 1915, you did put in three fans, did you? A. No; we had one fan in each compartment.

Q. Oh, but that made it three fans in the machine?
A. In the three compartments.
163 Q. In the three different compartments?
A. Yes, sir.
Q. And with those three fans, one located in each of the three compartments, was the circulation in effect substantially the same way as in the machine in your patent? A. No.
Q. What was the difference?
A. It was not sufficient; it would not be sufficient;—it would not produce a current of sufficient velocity in that other type of machine, but with the one age of eggs, or eggs that were of the same age, we had spaces between them, which would keep the air at a reasonably even temperature.
Q. And did you succeed in hatching eggs? A. Yes, sir.
Q. This machine as you then used it,—I mean the one that you brought from Attica, and as you used it there at Cleveland, Ohio, in 1913 and 1914, was open to the inspection of the public, was it not? A. Yes, sir.
Q. You did invite people to come there? A. Yes, sir."
Q. And, to your knowledge, were more or less newspaper articles, describing that machine, published in the daily papers of Cleveland, or some articles?
A. Yes, there were articles published."

The witness then identified the photostat of page 5 of the Sunday Cleveland Plain Dealer of February 23, 1913, and particularly the article therein appearing entitled, "Mammoth Incubator will Turn Out 20,000 Chicks Per Week", and states that he recalls that article as having been in that paper, and the photostat was offered and received in evidence on behalf of the defendant, and marked "Defendant's Exhibit A."

Then the witness next identified a photostat of page 5
164 of the Cleveland Leader, issue of Sunday February 22, 1914, and particularly the article therein appearing, headed "Cleveland Boasts Largest Hatchery", and stated that this article was published in that paper at that time, and the photostat was offered and received in evidence, on behalf of the defendant, and marked "Defendant's Exhibit B".

Then the last question and its answer read as follows:

"Q. Well, you know, Mr. Smith, that these articles refer to your machine, do they not, that you had there in Cleveland?
A. Yes, sir."

Samuel B. Smith's Testimony, Under Cross-Examination. (pp. 182-185).

Repeats that he did not have stage incubation in his Cleveland machine in 1913 and 1914. Repeats that the machine

had three compartments. That one compartment was loaded at a time and the compartments were generally loaded on the first days of the week and then the eggs remained in the respective compartments for about three weeks, or until they were hatched. Says the results were not quite as good as had been secured by him from the old type of sectional machines. The percentage was somewhere near the same, but a small percentage less, being about 40% to 45%. Being asked what the trouble was, he said that the eggs in that 1913 and 1914 machine would heat up too much at hatching time, would begin to heat up a few days before the hatching would come off and would get so hot that they had to open the door and blow air in to get rid of the heat. Said that chicks would die in the shells from overheating.

Being asked whether or not he had anything to do with preparing the copy of either of the newspaper articles that had been introduced in evidence, he answered

"They sent the reporter out to get some notes and he is the one that wrote it up."

Says he did not go over the articles before they were published.

Then, the further proceedings on pages 183 to 185 of the typewritten trial record were as follows:

"Q. Will you direct the Court's attention to that portion of the article in the 'Plain Dealer' of February 23rd, where it describes the manner of filling the incubator?

A. Shall I read this?

Q. Yes.

A. 'A big incubator is built with three compartments'.

The Court: Will you talk louder; we have a great deal of noise out here, Doctor, and it is quite difficult to hear when you drop your voice?

The Witness: All right. 'A big incubator is built with three compartments. Each compartment will hold 33,000 eggs. One compartment was filled last week. Another will be filled this week, and a third will be filled next week, and at the end of that time the first compartment will have hatched its eggs, and will be ready for filling again. In this way, after the first three weeks, there will be about 19,800 chicks put upon the market every week.'

By Mr. Ely:

Q. Now, at this date,—when was that with respect to any actual hatchings that you had at that time, at February 23, 1913?

A. There had been no hatching at that time; the first eggs had been set about two or three days.

Q. That was what you had hoped to get?

Mr. Williamson: That is objected to as grossly leading, your Honor. He is an intelligent witness, and is capable of answering a direct question.

The Court: Well, let him describe what it was.

Mr. Williamson: Without leading him.

The Court: From the testimony that they had not had any hatchings yet under that machine, and the statement was that the next week they would get so many chicks, and the next week so many chicks; I would draw the conclusion
166 from that, that it was a prophecy, as far as this testimony is concerned.

Mr. Williamson: A what?

The Court: It is a prophecy.

Mr. Williamson: Well, you said that he had not used it, or commercially used it?

The Court: Well, I am talking about that statement at that time.

Mr. Ely: That is counting the chicks before they are hatched. I think that is all."

Samuel B. Smith's Testimony. Under Redirect Examination.

The questions then put to the witness and his answers thereto, read as follows:

"Q. In the last question put to you you were referring to the article in the Sunday Plain Dealer, February 23, 1913, were you not? A. Yes, sir.

Q. Now the article in the other paper, to-wit: the Cleveland Leader, on Sunday, February 5, 1914, was a little more than a year later, was it not? A. Yes, sir.

Q. By that time you had successfully used that machine, had you not, for hatching eggs? A. Yes.

Q. And so that article that appears here, 'Cleveland possesses the largest hatchery', is based on information that you gave to that reporter yourself?

A. I couldn't say exactly that it is, because I don't remember all those circumstances back that far, but I have no reason to doubt but what it was."

167 E. H. SNOW'S Testimony. Under Direct Examination.

E. H. Snow, the defendant, called as a witness on his own behalf, testified to the following effect, reproduced part thereof in narrative form and part thereof in full.

States that he is forty-five years of age. Resides at Sleepy Eye, Minnesota, and is the manager and overseer of the Snow's business. This business has been conducted under the names E. H. Snow, Snow's Hatcheries, and Snow's Incubator Company. Has run his incubator business somewhat separate from the hatcheries to keep records and therefore, he calls the hatcheries "Snow's Hatcheries" and incubator business "Snow's Incubator Company". In his Hatcheries Company, he hatches chicks and in the Snow's Incubator Company, he makes and sells incubators.

Has been engaged in the incubating business since 1909. In the years 1909 and 1910, was in the employ of the M. W. Savage Company of Minneapolis, Minnesota, for the manufacture of the Jewell incubators. Thereafter, was at Wabasha, Minnesota, for a short time and then came to Sleepy Eye, Minnesota, where he has remained ever since. Left Minneapolis between 1911 and 1912.

Then his immediately following testimony, in full, pages 188 to 231, inclusive, of the typewritten trial record is as follows:

"Q. But you were engaged in the incubating business when you were here in Minneapolis, were you not?

A. Yes, at that time my first experience.

Q. In 1909? A. In 1909.

Q. Go ahead.

A. And I, being interested in the incubator business, I purchased many different types of incubators, such as at that time was known as the Wisconsin Incubator, the Buffalo Incubator, and Sure Hatch Incubator, the Wisconsin Incubator and different types of incubators, to satisfy myself on that problem. And later on I purchased the Boling Incubator, the James Way Incubator and—I can't just recall all of them and during these times I was in the manufacturing or ex-

168 perimental stage of building incubators. I built all types of incubators to try to the best of my knowledge to find out the best principle of incubation and up until the present time my incubator trays in the incubator of which I speak of, I worked on that incubator a long time and in—about 1929 I got it to where it was a good incubator, and to where I figured it was and to where it was better and could turn out good, healthy, quality, livable chicks. I was inter-

ested in the quality and the livability of the baby chicks, the livability being one of the main factors in my experience, and in all the experience I had. We had many difficulties in —we could hatch the chicks, but in the livability. So I built this said incubator, and this incubator is a—As you walk into it is one room, no partitions, no curtains, no deflectors or of any kind. The entire room is being kept at even temperature by agitators placed adjacent to the outer walls. These agitators are run at a low speed, the speed I try to run these at around 200 revolutions or round about 200 revolutions per minute, and which I found to be a good agitation and distribution of what you call of the air throughout this incubator. Then my—one of the main things was to place the trays in this incubator in order to save labor, in order to put them where they would hatch quality chicks and not be overheated, and to eliminate hot and cold spots such as has been found in many incubators. The air in this incubator during its agi-
tation is being agitated over and under the eggs on
169 what you would say a horizontal plane. This agitation
over the eggs in a horizontal plane does away with hot and cold spots in incubation, as I have tried that and tested that. The agitators are run on the outer wall where the air —adjacent to the outer wall where the air is more or less cooler and doing away with the exposed cold wall and eliminating the cold spots in the trays. Now in placing the eggs in this incubator it is not necessary at all to be lowered for the reason that the air is taken off of those eggs or agitated across those eggs and through to a certain extent on the horizontal plane. Therefore the eggs in the advanced stage of incubation do not get any warmer than the fresh eggs and the air is not forced from the advanced stage of incubation to the lesser stage by columns of air. It is merely agitated, and is agitated to the best of my ability. I built this incubator and I tried out every type of incubator that come to my knowledge. I built incubators with fans in them. I blew the air up and blew the air down; I blew the air sideways, and in other ways, but in all of my experience and what chicks hatched, I found no better chicks, no better incubation, no better incubator to handle, no easier incubator to operate in setting the eggs and taking off chicks than the incubator I have here designed. The eggs are placed in there in what you would say a sandwiched position. That is, we will say we will start here at the bottom
or the top—it is immaterial—but in my case I start at
170 the top and I have marks on the back of the incubator
showing the way I endeavor to set the incubator and have tested it out and have proven beyond a doubt and to anybody that—I have proven that point, that the way I have

set the incubator is the most practical and best way to run it, and that way is we place the trays, we will say one at the top, and skip two trays and place one more. That would be, we will say, the first of the month. Then we will wait three days and we will skip two more trays, and put in two more trays, on that date, three days in between there, and then we are down fairly well close to the bottom. That is on the—that would be on the—that would be on the 4th of the month, the second hatch. The first hatch would go in, we will say, on the first of the month, and then the following set would go in on the fourth of the month. Then we will wait three days later and we will go up towards the top again and start over, because there is a difference in the heat of the eggs there at the period of hatching time, or about the time when they began to throw off heat, we have a lapse there of a certain day's period, whereby it makes it possible to keep the eggs at a uniform temperature, and therefore, not being bothered with a lowering device or shifting device until the day of hatching time. The hatch time I would say—what I mean by hatching time is, we incubate to—it takes approximately 21 days to incubate an egg to get a chicken out of it. In about 18 days from the time we set these eggs they are taken
171 off, taken out of the setting comparment and placed in the nursery or hatching compartment so that the chicks can be kept separate and do not jump around in the incubator and can keep our chickens, the different breeds, in the different trays. We have this incubator thermostatic controlled. I worked on many thermostats and I have thermostats of my own design, and I have purchased thermostats. I am still working on thermostats. The thermostat that I have in many of my incubators are of my own design entirely. And the moisture—the incubator is also equipped with what you would call as near an automatic moisture device as can be procured, to the best of my knowledge. We have the evaporating pans and we have an automatic motor driven humidifier to take care of the moisture also, which can be set to keep the wet bulb at the degree of moisture which we determine is the best suitable for to produce a good quality livable baby chick. This incubator of mine does not require a lot of outside air or a lot of exhaust air out of the incubator for the reasons that the air is agitated over all the eggs and the chicks—the eggs do not become overheated and therefore it is not so necessary to introduce a lot of outside air. I don't know of anything else I can—

Q. Can you make a diagram illustrating to the Court, and making it more easy for him to understand, how you set the eggs?

A. Yes, I will just step right up here. There is twelve
172 trays of eggs, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 and 12 up and down. We will start out by setting this one and this one. That is the first set on the first of the month. Then on the fourth we will set this one and this one—

Q. Give him the numbers.

A. Then on the next we will start back here. That would be there. That would be on the following. Then we will go down here. That is the set. Here is five and five. And the last set we will put in will be here and here. We can start here, but this makes it—this makes it uniform all throughout. This is marked on the back of my incubator, these numbers just like that. I will say again it is not necessary and we do not lower any eggs.

Q. Please place the days of the assumed month alongside of your numbers there. That will make it more easily understood.

A. This will be the first of the month. That would be the fourth, and then the next would be the seventh.

The Court: I guess you have got that wrong. This is the first.

The Witness: Yes, these two are the first of the month.

The Court: Then the next one would be—

The Witness: This would be 4. Then it would be the 7th, wouldn't it? That would be the 7th, and then the 10th would be the next, and then the 13th would be—13 would be
173 5—the next would be the 16th and two days later, three days later, we take them out and take them down.

The Court: That is three days later you take out those you put in first.

Mr. Williamson: The diagram made by the witness is offered in evidence on behalf of the defendant to be marked as Defendant's Exhibit C, egg setting sketch.

(Defendant's Exhibit C is marked for identification by the reporter.)

The Court: Egg setting plan?

Mr. Williamson: No, egg setting sketch.

The Court: Received.

Q. In what ways, with what material have you heated this incubator which you have described?

A. I have heated that by steam, and also by electricity. My experience in steam heated incubators, it is not necessary to have a large boiler in connection with the steam incubator and in using a small steam boiler, which I have a lot on some of my incubators, it is rather difficult to carry an even—what you would say a regular pressure. Say, for instance, you are running a pressure of about—you can't run too high a pressure on account of the thermostat in the incubator. I aim to run around 1½ pounds of steam and not over that, because I have an open tank on the steam boiler. Now in running the incubator on a pound and a half of steam it is very difficult to carry a uniform pressure of steam in a small steam boiler without watching the steam boiler
174 at all times because when you throw on coal the steam goes down and therefore you would have an irregularity in your incubator. I went—I set forth to develop an oil burner in order to take care of this boiler and carry a pound and a quarter to a pound and a half of steam, never dropping below a pound and a quarter and not going over a pound and a half, therefore in maintaining an even steam pressure of approximately a pound and three-eighths, or a little less than a pound and a half, I was able to keep a uniform temperature throughout my entire incubator. And I have not only put them on my own, but I have put them on others and that problem alone has solved a lot of difficulties in my incubator business. And it is the only type of oil burner and the only kind of oil burner, to the best of my knowledge, that has been offered to the trade or the only kind of an oil burner that would carry a low steam pressure to that degree to the best of my knowledge that is on the market today. I don't know of any but what will fluctuate from three to five pounds, and that is not good for the heating of an incubator. This oil burner I have developed myself, entirely myself, and have put it in use on my incubator which has been successfully in operation.

Q. When did you begin to make the electrically heated incubator?

A. The electrically heated incubator I come out with about two years ago.

Q. Why did you adopt the electrical?

175 A. The reason for adopting the electrical heated incubator is because you—it is a little more simplified, and about anybody can run it because you only have a switch to pull in and out and it makes it a little more convenient for the party that is unexperienced in the hatchery field.

Q. Have you got any of your own makes of incubators here in the city at the present time? A. Yes.

Q. Where is it located?

A. I have the incubator in the Annex of the Flour Exchange Building, 323 South Third Street.

Q. Third Street South? A. Third Street South.

Q. Is that an electrically heated incubator?

A. That is an electrically heated incubator.

Q. When was that machine made?

A. That machine was made in the year of 1930.

Q. Have you ever used it?

A. I used that incubator for demonstrating purposes.

Q. Where? A. At Sleepy Eye.

Q. What do you mean by demonstrating purposes?

A. I would heat that—run that incubator to show the operation and air movement and so on and so forth in my incubator.

Q. In dealing with prospective customers?

176 A. Dealing with prospects and also anybody that was interested in the incubator or hatching of baby chicks.

Q. Have you made any photographs of that electrically heated machine that you say is now located at 323 South Third Street in the vicinity of the Flour Exchange?

A. Yes. That is 323. I don't know if I said 223 or not. That is 323.

Q. I show you here a set of photographs and ask you to state whether you recognize the same or not? A. Yes, sir.

Q. What are they?

A. They are photographs of my machine at 323 in the Flour Exchange, Minneapolis.

Q. Did you see those photographs taken?

A. I seen those photographs taken.

Q. How many views have you got in your hand? How many photographs have you got? A. I have four.

Q. You can state just what the nature of the views are.

A. Do you want me to get up there and show them—

Q. Just state what one of them shows? A front view?

A. One of them shows a front view here, perspective, and the other one just a little angle of the front showing the motor and pulleys, and the cold air box, and one shows the interior of the incubator looking from the front through the door with the trays and everything in readiness to

177 start that incubator for hatching. On the one side it shows the trays removed and shows the location—

Q. Another view?

A. Yes, another view shows the trays removed and the location of the agitator behind the bars where the trays fasten in.

Q. Are held up?

A. Are held up, yes. Also shows the cold air openings in the rear of the agitator.

Q. You mean the air inlets? A. Air inlets, yes.

Q. Do the foul air outlets show any place in these photographs?

A. Yes, as you look in the incubator from the door—

Q. In the interior?

A. In the interior you will see the slides and then partly—which way this incubator is being operated, right in the middle of that aisleway, in the walkway, in the middle up overhead is the cold—is the warm air outlets or exhaust ports. It also shows the numbers on the rear of this incubator.

Q. Have you now got another photograph in your hand?

A. Yes, sir.

Q. Is that taken from this same machine? A. Yes, sir.

Q. And how does it differ from the other photograph that you had in your hand that was looking through the door of the machine?

178 Mr. Williamson: This isn't right, Ralph, you have the wrong photograph here.

A. This one—the difference here in this photograph shows the moisture pan removed from underneath.

Q. One of them?

A. One of the moisture pans removed and the other photograph shows with both of the moisture pans in.

Q. And why was one of the moisture pans removed?

A. To show the heating elements, radiating elements, which the incubator is being heated by.

Q. How many views does that make that you have, four of them, five? A. Five, yes.

Mr. Williamson: The five photographs identified by the witness are offered in evidence on behalf of the defendant and will be marked as Defendant's Exhibits D-1, D-2, D-3, D-4 and D-5.

(Defendant's Exhibit D-1 to D-5 inclusive are marked by the reporter for identification.)

The Court: Received.

179 Q. Now, as I understand it, this machine here in Minneapolis is an electrically heated machine?

A. Yes.

Q. Did you have an incubating machine which you designed and manufactured in the basement of your building at

Sleepy Eye, Minnesota, at a time last fall when Mr. Ely, counsel for the plaintiff, and Mr. Taggart, their expert, came to your place at Sleepy Eye to see it? A. Yes.

Q. Is that a steam heated machine? A. Yes.

Q. Have you ever had a photograph of that machine taken? A. Yes.

Q. Have you got the photograph in your hand there?

A. Yes.

Q. How many views? A. We have three here.

Q. State what they are.

A. We have a front view, or front and side view, and then there is a view through the center showing myself.

Q. Through the door?

A. Through the door down the walkway was myself, with a tray of eggs, and then we have the same view without anybody being in the incubator, showing the floor and the ceiling to a certain extent, and the back wall and the sides—and the front of the trays.

180 Mr. Williamson: The photographs identified by the witness are offered in evidence on behalf of the defendant, to be marked as Defendant's Exhibit E-1, E-2 and E-3, the photos of the Sleepy Eye machine.

The Court: Received.

(Photographs referred to marked by the reporter for the purpose of identification as Defendant's Exhibit E-1, E-2 and E-3.)

Q. State whether or not that Sleepy Eye specimen of your machine, whether or not it is electrically heated or steam heated? A. It is steam heated.

Q. Please state whether or not that steam heated machine in the basement of your building at Sleepy Eye, was tested at the time Mr. Ely and Mr. Taggart were there on behalf of the plaintiff, and myself and Professor Rowley on behalf of the defendant? A. Yes, it was.

Q. State whether or not after the defendant got through making the test, counsel and Professor Rowley got through making their test of that machine, whether or not Messrs. Ely and Taggart were permitted to make tests on behalf of the plaintiff? A. They did.

Q. You saw those tests, did you?

A. I did. I was there.

181 Q. Now, what, if any, is the difference between this machine of yours at Sleepy Eye, this steam heated machine, and this electrically heated machine, which is here on the first floor of the Flour Exchange at Minneapolis, at this time?

A. There is very little difference.

Q. What is it?

A. There is a slight difference in the height, and a little difference in the nursery or hatching compartment in the bottom where the finished eggs, you might say, are put in, and a little difference in the measurement, a slight difference, and I don't know if the fans are about the same. I never measured it, but the difference in the entire incubator is very slight, and in fact, nothing to make a material difference.

Q. I suppose you mean with the exception that one is electrically heated?

A. One is electrically heated and one is steam heated, but we run the temperature to the same degree of heat in both the electric incubator and the steam incubator, and all the difference is one we run with a steam heated oil burner proposition and the other we run with electrical heating elements.

Q. Is there any difference whatever in the operation so far as the circulation of the air is concerned?

A. No.

Mr. Williamson: Counsel offers in evidence on behalf of the defendant the electrically heated specimen of the
183 Snow Incubator now located on the first floor of the
182 Flour Exchange, at what is the number?

The Witness: 323.

Mr. Williamson: At 323 Third Street South, Minneapolis, Minnesota, with the understanding that it will be necessary for Mr. Snow to commercially use this machine during the coming hatching season, and to prepare for it, which, I believe begins in February and extends through March, June and July, is that right?

The Witness: Yes.

Mr. Williamson: The same to be marked as Defendant's Exhibit F, with the word "Snow's Electrically Heated Incubator."

The Court: That will be received.

Mr. Ely: I ask the same permission to remove that Smith Incubator we had over in the warehouse where we saw it in operation.

The Court: I will permit that be done.

Mr. Williamson: How about the Plaintiff's model of the Snow machine? Do you want permission to use that too?

Mr. Ely: Oh, no.

Q. Now, why did you not bring down here your steam heated specimen of your incubator, which was located in the basement of your building there at the time Mr. Ely and Mr. Taggart were present at the tests this fall?

A. That incubator is built into the building, and was
183 built there stationary and the only way it can be taken out is to be all sawed in pieces, which would practically ruin it because it would not have air tight joints thereafter, and therefore, I brought the knock-down machine, which could be moved from one place to another, and all those machines have all been built knock-down.

Q. You mean your electrically heated machine?

A. Yes.

Q. State whether or not any of the parts that were used by you on the Sleepy Eye specimen at the time Mr. Ely and Mr. Taggart were there, at the testing of that machine, have been placed by you on this electrically heated machine, which is now on the first floor of the Flour Exchange?

A. Yes.

Q. Specify the parts.

A. I figured in order to save argument, I brought down the same pulleys and the same belts and the same motors and put them on this machine here, so it would be run at the same speed, and there would be no argument as to the identity of the incubator. I also brought down the same trays that are in that incubator, and everything I could take down easily, because it is all interchangeable,—the same pulleys and the same motors and the same belting and the same trays and the same end gates for the nursery department and everything practically I could bring down, I brought down for this incubator and which was used on the incubator at
184 Sleepy Eye in my basement of my building.

Q. State whether or not after this electrically heated specimen of your incubator was located here at the place you have stated in Minneapolis, tests were made on behalf of the defendant of that machine to see what the air circulation was in that machine? A. Yes, it was.

Q. When were those tests made?

A. Well, those tests were made day before yesterday.

Q. Monday, wasn't it?

A. Those tests were made on Monday.

Q. Last?

A. Yes, they started,—I don't know just what hour they started.

Q. Well, that doesn't make any difference. They started on Monday of this week.

A. Yes, Monday of this week.

Q. Was Mr. Ely and Mr. Taggart there on behalf of the plaintiffs?

A. They were there all the while.

Q. Who else was there?

A. Mr. Ely and Mr. Taggart and Mr. Williamson.

Q. Which Williamson?

A. Mr. James Williamson and Mr. Ralph Williamson and Mr. Rowley and myself.

Q. Wasn't Mr. Taggart and Mr. Ely there?

185 A. I stated that Mr. Ely and Mr. Taggart were there.

Q. And Mr. Olson, of Paul, Paul and Moore?

A. Yes, and Mr. Olson was there. I didn't remember his name.

Q. Was Mr. Rowley there?

A. Yes.

Q. Who was in charge of the tests?

A. Professor Rowley.

Q. On behalf of the defendant?

A. Professor Rowley.

Q. The gentleman sitting here in the court room?

A. Yes.

Q. Were Messrs. Ely and Taggart present throughout the making of it, of the whole of those tests? A. Yes.

Q. Were they given opportunity to make tests of their own, if they so desired, after the defendant got through?

A. Yes.

Q. Now, just describe in your own way the air circulation in your incubating machine that you have made and used. I want the air circulation. What is the means for the air circulation or what air circulation have you gotten there in your steam heated incubator, or your electrically heated incubator? Perhaps I ought to ask you, you have already testified, have you not, that you have several of these steam heated incubators in actual use?

186 A. I have some.

Q. How many?

A. I have four.

Q. That were made and used before this suit was brought?

A. Yes.

Q. Now, just describe in detail in your own way, based on your own experience, with the machine, just how the air is circulated in your incubating machine.

A. Well, in the incubators, the electric and the steam, the air is circulated the same in both of them. That air, as I said before, is agitated by agitators adjacent to the outer wall in the cooler spots of the incubator, as it would stand to

reason, the cooler places would be on the outer wall. That air is being agitated by the four bladed agitators, and run at a low speed, which, as we hope to run them, at about 200 revolutions per minute, or around there. There is some outside fresh air taken in through openings on the side, which is above the center of the agitators; they running at a slow speed causes a certain distribution of the air throughout the incubator, which works and goes out and expels somewhat from the end, and somewhat towards the front and somewhat going back towards the eye of the fan, and, therefore, causing a complete mixture and agitation of the air in the entire incubator. The air is moved over and under the trays and in some places it may have a slight outer movement, but the main movement of the air is more
187 on a horizontal plane in that incubator, and, therefore, eliminating any hot or cold spots, and causes the chicks to hatch at the same time,—at the same time in the trays, that are set at the same time, and by having no cold spot or hot spot in the incubator, you get a better quality chick and a better livable chick and a better looking chick, than one which is not properly hatched. There is somewhat greater movement of the air around the outer wall,—the entire outer wall and the ceiling and all, to a certain extent, which takes care of any exposure and makes it possible to carry an even temperature throughout the incubator.

Q. Is there any column of air?

A. There is no columns of air because it is not necessary to have columns of air, in that incubator. It is simply made on the principle whereby the air can be agitated and moved between the trays at a slow movement to take off any excess warm air that might be there, or any cold air, and it is not necessary to have a large volume or current of air forced in any way through or on the hatching trays or in that incubator.

Q. Did the test that you saw made of these incubators of your own, either the steam heated one at Sleepy Eye, or the electrically heated one here in Minneapolis, give you any reason to change your own theory of the operation of the air circulation in your own machine?

A. Not in the least.

Q. Did it tend to corroborate your own theory?

A. No,—what is that?

188 Q. Did the tests give you any reason to change your opinion of the air circulation in your machines?

A. No.

Q. Did you hear Mr. Taggart testify on behalf of the plaintiff in this case? A. Yes.

Q. He made some remarks in his testimony about the rate of speed at which your agitator turned, or what he called fan turned in the Sleepy Eye test, when it was tested there at the time he and Mr. Ely were there last fall, and the fans or agitators on your electrically heated machine here in Minneapolis. Do you remember that? A. Yes.

Q. In the actual commercial usage of your machine, did you always run these agitators at the same identical speeds?

A. These agitators are hooked up with V-shaped belting, and is run from one,—both agitators on one side,—two agitators on one side, that is run from one motor by a V-shaped belting, and these V-shaped belts, of course, cause more or less slipping and there may be a difference in these agitators, but it does not make any material difference in the incubator, because the air is moving in different ways in that incubator, and it does not make any material difference whether the agitators are running at 165, or such a matter, to 208. We aim to run them around about 200 revolutions per minute,

189 and that incubator that I have in the Flour Exchange would be run exactly the way it is now and will be sped exactly the way it is now. The incubator that I have in the Flour Exchange will be run and operated,—the motors will be run at the same speed they are now, as to the best of my knowledge, because they are hooked up by electrical current, and the belting will be put on the same as it is now, and the pulleys will be the same as they are now, and the incubator will operate the same as it does now, which is the condition and the operation of all my incubators.

Q. Did you ever purchase from the Smith Incubator Company any specimens of the Smith incubators? A. Yes.

Q. Which was marketed under this patent here in suit?

A. Yes.

Q. When did you get your first one?

A. About along in 1924.

Q. How many have you bought from that concern?

A. About twelve.

Q. Did you put them into use? A. Yes.

Q. Here in this state?

A. Yes,—not all in this state. Two in South Dakota.

Q. You put several to use in this state, did you not?

A. Yes.

Q. When did you put the first one into use in this state?

A. Along in 1924.

190 Q. Have you got in the City of Minneapolis at this time any one of those Smith incubators that you bought from that concern? A. Yes.

Q. Where is it located?

A. It is located in 323 Annex of the Flour Exchange in Minneapolis on Third Street.

Q. Is it in the same room where your electrically heated incubator is located at this time? A. Yes.

Q. How long have you used that particular machine in your incubating business?

A. We have used that off and on,—off and on since,—I will figure from the time I got that,—that was in, about 1926, —1925, I believe,—1925 is when I got that incubator. That was one we had at Mankato and I purchased them in 1925.

Q. You have been using it ever since? A. Off and on.

Q. Have you any photographs of that specimen of machine? A. Yes.

Q. Please inspect these which I have and state whether or not you recognize them? A. Yes.

Q. Are these photographs of that machine? A. Yes.

Q. Were they taken in your presence?

191 A. Yes, sir.

Q. What are the different views?

A. We have a front view on the door,—the door is closed, showing the name plate of the Smith Incubator Company. Then we have a view looking down the corridor.

Q. Through the door?

A. Through the door with the curtains,—it shows the curtains and the rear of the incubator and the fan panels and the thermostat and the floor and the nursery department. Another view,—one of the views is in the fan panel, which is let down, showing a cold air intake, and also shows the side walls of the incubator,—the curtains, which act as a part of the partition and the floor and the rear wall.

Mr. Williamson: The photographs identified by the witness are offered in evidence on behalf of the defendant and are to be marked Defendant's Exhibits G-1, G-2 and G-3.

(Photographs referred to marked by the reporter for the purpose of identification as Defendant's Exhibits G-1, G-2 and G-3.)

Q. State whether or not this specimen of the Smith machine shown in these photographs, and located in the same place as your electrically heated Snow incubator is, was also tested on Monday last, in the presence of counsel for the plaintiff, Mr. Ely, and their expert, Mr. Taggart?

A. Yes.

Q. And others? A. Yes, sir.

192 Q. Who made those tests?

A. Mr. Ely was in charge,—I mean Professor Rowley and Mr. Ely, and Mr. Taggart, and myself, and Mr. James Williamson and Mr. Ralph Williamson were all there.

Q. All there at the tests? A. Yes, sir.

Q. After the defendant got through making the tests it desired to make, was Mr. Ely and Mr. Taggart given a chance to test that machine? A. Yes, sir.

Q. Did the operation of that machine, as then tested, give you any reason to change your theory of the operation of that machine, from the one that you had formed from your long experience with it? Did it give you any reason to change your theory of the air circulation? A. No.

Mr. Williamson: The said specimen of the said Smith machine, now at the place identified by the witness, in Minneapolis, is offered in evidence on behalf of the defendant and is to be marked, "Defendant's Exhibit H, Snow's Specimen of the Smith Machine."

Your Honor, it is now five o'clock. May we adjourn?

The Court: Yes.

(Adjournment taken until 10 o'clock A. M., November 18, 1932.)

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193 November 18, 1932,
At 10 o'clock a. m.

Hearing resumed pursuant to adjournment.

Court and counsel present.

Mr. Williamson: If Your Honor please, I just wish to add to the record that the exhibit machine, offered near the bottom of page 213 of transcript, to-wit: "Defendant's H, Snow's specimen of the Smith machine," was offered on the same understanding that I had about his own Snow machine, that Mr. Snow used commercially, that it is subject to Your Honor's inspection at any time that you desire.

The Court: Yes.

Earl H. Snow, recalled, testified as follows:

Direct Examination (Continued).

By Mr. Williamson:

Q. Mr. Snow, is that specimen Smith machine, which was offered in evidence when you were last on the stand, and just

before adjournment last night, and which is marked "Defendant's Exhibit H, Snow's specimen of the Smith machine," in the same condition now that it has been throughout the time that you have used it, wear and tear excepted?

A. Yes, sir.

Q. Mr. Snow, will you please describe in your own way the air circulation in that particular specimen of the Smith machine, and all the Smith machines that you ever used commercially, as based on your actual experience in
194 the handling and usage of these Smith machines?

A. In the Smith machine you will find,—as you walk into them, you will find an aisle way, or corridor, partitioned off by curtains to each side of you, and making an incubator with four partitions, you might say, the two side wall partitions and the fan panel gallery partition. As you walk into this incubator, on each side you will find heavy curtains, acting as partitions in that incubator; and back of these curtains you will find tiers of eggs or trays there located.

The heating elements and heating pipes and cooling pipes are overhead, above, right close to the fans, very close to the fans, and are partitioned off from the rest of the incubator by the beams and fan panels.

The air in that incubator is forced, or is created by a high speed fan, which is timed to run at practically 1800 revolutions per minute. With a load, it is sometimes reduced to 1750, but they run at different speeds, because they are not that perfect. But the speed of that fan, in ordinary terms, is supposed to be 1800 revolutions per minute. There are four of these fans in each incubator, and those fans running at that speed cause a large volume,—a forced circulation,—a large volume of air coming down through this corridor, forced down through this corridor and aisle way, down to the floor, where it is mushroomed, and some of it coming down underneath the hatching trays, and some of it turning underneath the edge of the curtains, and thereby going
195 up in between the tiers of trays. This is done constantly by the continual operation of these fans; they are not supposed to be stopped; the partitions are not supposed to be removed, or the curtains removed, as a part of the partitions are called curtains, heavy curtains. The eggs in this incubator are set at the top, that is, fresh eggs are set at the top, and the instructions by the Smith Incubator Company are to set them in this incubator, two trays at a time around the top of the incubator. And their instructions are also to set this incubator twice a week; and as you put

eggs into the incubator, and as incubation proceeds, you are to wind down, or to lower down by the mechanical lowering device; it is lowered down with a crank and sprocket, which is run by an endless chain, fastened thereon, and the eggs are lowered down from time to time, as the setting goes on. As the setting is twice a week,—at the end of the period of around about the sixteenth to the eighteenth day, in there, the eggs have reached the bottom of the endless chain. It is absolutey necessary to lower these eggs in the Smith incubator to get any kind of hatching at all. It is absolutely necessary to lower those eggs or the chicks that would hatch from those eggs would not be any good, as we tried that out. They will overheat in the period of incubation from the top to the bottom, if they were not lowered, and thereby overheating would cause a disorderly or a very bad situation in
the hatching of these chicks, and the amount of chicks
196 hatched, if they were not lowered, would be a very
small percentage, and the chicks that would hatch would not be liable to live, and there would not be very many salable chicks hatched out of that incubator. Therefore, they have made that incubator with these chains, and the chains run down the center of the tray, so that it is practically impossible to get a loaded tray of eggs out of that incubator, from the time you set it until the time you take it off at the bottom. They don't plan on taking it out; that is not their instruction. If you were to try to take them out anywhere in between the top and the bottom, you would be liable to break all the eggs in the tray, and break possibly other eggs in the other trays, in endeavoring to take the tray from the setting chains. As far as egg shells are concerned, as to being handy or taking the trays off from the bottom, there are no chicks hatched in the setting chains; there are no egg shells in the setting trays on the top chains, because if there were, the chicks would jump around in the incubator, and would not be in a position to be treated, or take care of the different chicks. It is absolutely necessary to take these trays off before the end, or before the twenty-first day,—it is necessary to take them off at about the eighteenth day, and put them in the hatching compartment; it is absolutely necessary to take these eggs off of the setting chains, and place them in the hatching compartment, in order to keep
the chicks in the trays, where the eggs are set, and in
197 so doing there is underneath,—put in the trays, and
put in the nursery department, where the chicks can be kept in the trays; they are not supposed to be hatched in the chain, and they are not hatched in the chains, in the

Smith incubator, in accordance with everything set forth in the recommendations from that company. Therefore, there are no egg shells or anything of that kind in the setting chains.

The air in that incubator is forced to the bottom, and is taken off from the chicks, and goes to the,—or is taken off from the eggs in the more advanced stage of incubation; it is absolutely necessary to force it up through the eggs in the lesser stage of incubation, by the method of this forced draft and circulation coming down through the corridor, at a distance of around six feet, or such a matter,—coming down and going underneath and up through these trays.

If the eggs are not lowered so that the heat is driven off from the eggs in the advanced stage, which we will say would be eighteen days along, they would become overheated up in the incubator, because the farther you go up in the machine, the more liable there is to be less travel of air; it is slowed up considerably, and there is liable to be hot spots.

Now, in the trays on the ends, or, I will say, on the back wall, the tray that is next to the back wall of the Smith incubator, will hatch many times a whole day later than the rest of the trays, and you will also find the back end of
198 many, many trays hatching much later; and it is necessary in lots of instances to carry over, and to take out those eggs, and place them in a different tray, and stick them somewhere else in the incubator, to get out the balance of the chicks. Those chicks are not the best chicks, because they are not hatched right. Lots of chicks,—in all of our experience, there are lots and lots of eggs throwed out, due to the fact that they are not hatched in time, and therefore go into the garbage can before the chick gets out of the shell.

Now, in this incubator, it is also necessary, and which we have practiced, to do what is called shucking the chick, that is, it is necessary to go through the trays and hatch the chicks out of the shell. If you don't do that, you are going to throw out considerable chicks. These chicks are the weaker ones, because of what I would say is improper incubation. If they are not helped out of the shell, you lose a tremendous lot of chicks. In fact, some hatcheries have a slate on the wall. On this slate, they will say, where they have more than one machine: "Shuck Number 1," or, for instance, they will say, "Shuck Number 2." By that, they mean, to go through the trays and to help out these chicks, and take out the egg shell off from them, so that they can get out of the shell.

This incubator also must be operated with the right amount of air coming in, or the right amount of air in
199 the hatchery room, to produce a good quality of chick. If that is not done so, by the way or ways that the air travels, you will have sticky chicks; it seems the down of the chick lies close to the chick; and they are not a good, respectable looking chick, if the incubator is not properly run, as to the air intake and the air in the room, that is, what I would say good air,—I will say good air in the room, and also fresh air coming through and distributed in through the incubator.

In this incubator we have found, with reference to the men that I have working in it, that they do not care to work in the incubator. I have had many of my help reject working for me, if they were to work inside of this incubator, due to the fact that a large volume of air is forced down upon their heads, and causing drafts and discomfort in the incubator. After a person gets used to it, it is not quite so bad, but it is rather uncomfortable, which would be shown in coming in a temperature of approximately ninety-nine degrees, and a humidity which averages from eighty,—a humidity that runs about approximately eighty-four at a wet bulb reading. With the humidity at practically eighty-four, and your temperature at ninety-nine, and with the air traveling such as it does in the Smith incubator, it is a rather uncomfortable situation; it is not very nice to be obliged to work in that machine any length of time.

Q. As that Smith incubator is organized in the speci-
200 men used by you, did you ever attempt to use it without curtains in the corridors? A. No.

Q. In your judgment, could it be used without those curtains, successfully?

Mr. Ely: I object to that as speculative; the witness is not qualified.

Mr. Williamson: I think it is a proper question, Your Honor; he has had a very large experience in the incubating business.

The Court: Of course, the credibilty of the witness is measured by the reasonableness of his testimony. I will let him answer, but if he states it without reason, why, it is open to objection.

A. What is the question, please?

(Previous question read by the reporter.)

A. No.

By Mr. Williamson:

Q. Why not?

A. Because it would permit to let air go in different directions, and would not reach the bottom stage of incubation, forcing the air around and taking the air from the advanced stage of incubation up through the others, and would be liable to cause what I would term irregularity.

Q. Irregularity in what?

A. In the incubator throughout.

Q. In the hatching?

A. Yes, in all phases of the incubator. It is made with
201 partitions, or with curtains, and they are made there to be used that way, and they have been proven out, that that is the way that they endeavor to run the Smith incubator.

Q. What is the strength of the currents of air that are forced down by the fans in the Smith incubator, if you know?

A. Well, I would not just know the strength, but I know there is a large volume of air. These fans travel at, say, 1700 or approximately 1750 revolutions per minute, and there are four of them; there is a terrific volume of air coming down, and, of course, it continues to come down through that corridor until it reaches the bottom of the incubator, at which it must, in order to succeed in hatching the eggs in the incubator.

Q. How about the velocity of these columns of air?

A. Well, they are running at a high velocity.

The Court: You are speaking of the Smith incubator?

The Witness: Yes.

Mr. Williamson: Yes, certainly.

By Mr. Williamson:

Q. What is your answer?

A. I would say a large velocity.

Q. A high velocity? A. Yes.

By the Court:

Q. I suppose the forced air in that incubator could be increased or lowered by the fans,—that is, by running them faster or slower?

A. Well, you could not run the fans any faster or any slower, because there is no rheostat; the fans come
202 running just the way they are with them open, and there is no means, or no way of slowing them down or speeding them up; they run at an equal given speed, at which

it is timed to run, or the given speed of the fan is 1800 revolutions per minute, and, of course, under a load, they vary.

Q. Well, of course, the fans could be regulated so as to have a variable speed?

A. I suppose so, if they are made. But if the fans in the incubator do not rotate with sufficient velocity to carry the air to the floor, and come up between the trays, the incubator would not work satisfactorily, because the eggs would overheat back of the partitions or curtains.

Q. Have you had any experience in your handling of the Smith incubator, where the eggs were overheated?

A. (Witness hesitating) Well, to a certain extent.

Q. What was the nature of this experience?

A. Well, if the eggs are not lowered down, or are left,—are not lowered down and the bottom was taken off,—

The Court: (interrupting) Just a minute. Pardon me, for a moment.

(Previous answer read by the reporter.)

A. (continuing) If the bottom eggs are not taken off, and they are not lowered down in the proper way, which is set forth, they would be liable to overheat.

By Mr. Williamson:

Q. In your experience with the Smith machine, were any of the eggs spoiled, so that they would not hatch, or
203 get good chicks, because the eggs were too cold?

A. Yes, sir.

Q. Explain that, so the Court can understand it.

A. The trays, especially on the ends of the incubator, and especially on the back of the incubator, the rear wall, in many cases we have found that there were eggs in there that did not hatch, for the reason that it must have been due to lack of temperature, and there were eggs at the end of the tray that would not hatch. We found that what would hatch on lots of the ends, and especially at the rear of the incubator, would, in lots of cases, come out later.

Q. Why not?

204 A. The reason for the delay of hatching would be due to improper temperature and most likely it would be cooled down because by speeding up them,—by raising the temperature in the incubator, it will make the eggs hatch sooner, and by running your incubator a little slower, it will cause the eggs to hatch later and, therefore, it would go to show that these eggs would not be kept under proper temperature,—if they would, they would hatch at the same time,

and, therefore, it must have been due to too cold,—due to the outside walls of the incubator.

Q. Why did you design and make and put into use your own incubator?

A. To get a better incubator.

Q. Better than what?

A. Better than any incubator that I have used, in any sense of the word, and I have used quite a lot of incubators.

Q. How about others on the market?

A. Well, I claim to build a better incubator, better than I ever used.

Q. State in what respects your own incubator is better than the Smith you used so long.

A. In the first place, my incubator has a one room proposition,—there is no partition of any kind; it is easy lighted so you can see; the eggs are handled easier; it can be run and operated by a woman or a lady; it can be set easier; it can be cleaned out easier; it can be sprayed with, or fumigated
205 easily, and it can be handled in all respects in incubation, to the best of my knowledge and to the working ability, as I have found it, easier, and it is more simpler in all respects, so far as the incubating of eggs is concerned.

Q. How about the circulation of the air, compared with the Smith?

A. The thing was to get away from cold spots and hot spots in the incubator. My main thing I set forth to do was to hatch eggs to produce the best quality livable baby chicks,—chicks that I could recommend to my customers, and build up a future trade; chicks that would live, and chicks that do not live for me, cannot live for my customers and we hatch many thousands of chicks in our hatcheries, self started chicks, and, therefore, we must have a chick that can live, and what I have set forth to do was to build an incubator better than anything I have ever used at any time before. In this incubator that I built, I built many different kinds of incubators. I tried out different methods at different times down through the years of my experience, and I finally got to the point where I used agitators and placed them adjacent to the outer wall, running at a low speed, and which they are only about three inches or such a matter from the eggs, the egg trays. The air has only got to move three inches or more from the agitators before they are beginning to come into contact with the eggs in my incubator. The main thing in in-

cubating is the hatching of eggs. That is what we are
206 interested in, in the hatching of eggs in the incubator.
We do not care about aisle-ways, corridors, partitions, or wood ware. We are materially interested in the hatching of chicks, or the hatching of eggs, and therefore, it is the eggs that we are particularly interested in and to keep those eggs at a uniform temperature throughout, and in order to do that in a way that will produce the best chicks. I set forth, in putting these agitators in my machine, running at a low speed, which was only necessary to run at a low speed, but on account of being in the cold spots of the incubator, which is on the outer wall,—that would stand to reason, the colder spots of any building or incubator is the exposed wall. I also attempted to put in there and create a little larger movement of air around the outer wall in all respects in order to take care of the cold spots that may be lingering along the walls, and then keeping a uniform temperature through the hatching egg chambers in my incubator. It is a more easier factor to keep an even temperature in those eggs when you are in close contact with those eggs than if you are a long distance from those eggs, and take, for instance, you hope the air will strike them, but, in my own experience I determined to put that in operation where I was sure of having the air movement to take care of any hot or cold spots, and, therefore, let the air go across the eggs in different horizontal positions because the eggs are stacked one on top of the other, and it would stand
to reason that the air taking off on a horizontal posi-
207 tion would be more in effect of keeping a uniform temperature than in any other wise. In this incubator of mine there is many, what I would say improvements and many things that you will find in no other incubator. We find in that,—the chicks that hatch from that incubator are a superior chick. They are not necessarily,—we do not recommend any shucking or any chickens picked out of the shell. A chick that cannot pick the shell and jump out of the shell is not a good chick, and, therefore, we do not recommend any shucking of our chicks. A chick that cannot get out of the shell in my incubator, we do not want him. The reason for the quality of chicks is due to the method in which the incubator,—in the method of the incubation and the method in which the incubator is run, and the method by which the air is taken care of inside of that incubator.

Q. How about the humidity?

A. The humidity,—I have tried different sets of humidity with wet bulb readings,—I have tried that at different sets. I have in Sleepy Eye just a place where I build and rebuild and reconstruct and dismantle and tear down incubators and

test them out to my satisfaction, and I have done that through on down the time that I have been in the incubator building business since 1909, to prove to my own satisfaction the best method of hatching eggs. I have used different kinds of heat; I have used different kinds of moisture devices that has ever come to me, such as from evaporation, and
208 vaporizing, and a motor, such as I have today in my electrical incubators.

Q. In your machine you have two agitators on each of the opposite side walls, have you? A. Yes

Q. Why did you dispose of your agitators in that way?

A. Because I wanted to get the movement of air along on the outer wall so that it would keep a uniform temperature through the egg chambers and take care of any air,—cold air that would be on exposed walls, and keep this air in movement, which was a hard thing to do along any wall, and, therefore, maintaining a mixture of the air, which goes in all directions in that incubator, which is agitated, and some air in that incubator goes from across,—that is due from the agitation.

Q. Some of it will come across what?

A. Some goes across the incubator in one way and some across the incubator in another way.

Q. In what direction?

A. All directions, which we can show you.

Q. How about in the corridor?

A. In the corridor, the air, as we have found it, does not make any definite path; it is churned in there, which we can show you by a smoke test, and which we have proved beyond a doubt to satisfy ourselves there is no current of air in the corridor going in a specific way, but is churned and brought in and brought out in all directions.

209 Q. Have you found in your experience with your own machine that you have any cold or hot spots, compared with the condition of other parts of the incubator?

A. We do not have no hot or cold spots in my incubator; that is, not hot or cold spots that would cause any damage whatsoever; that would amount to a trifle.

Q. Is that due to the more thorough circulation of your air?

A. Yes sir, and the air not being driven such a long distance.

Q. Were you in the habit of keeping records of the percentage of hatches in your usage of the Smith machine?

A. Well, we kept certain records. We can give you a brief estimate of how our hatches run. We have in the Smith incubator, where one hatch would hatch fairly good, and the

next time not so good and it seemed to keep on,—you could never rely,—in fact, we put in our incubators what is called custom hatches,—we take the eggs in from the farmer, and place them in that incubator for hatching. This farmer gets back the chicks we hatch out of there. We charge him per egg for hatching those chicks. That is what is called custom hatching. We could never guarantee and never could know what kind of a hatch you would get out. We have never been able to get two hatches alike.

Q. In the Smith machine?

A. In the Smith incubator, not in the history of my business.

212 Q. What was the percentage according to your best estimate,—I mean the percentage of hatching to the eggs that were set?

A. We place our hatchable chicks,—we will go to work, and we will say we have orders for chicks, and we will base that on 50 per cent of the eggs set.

Q. That is in the Smith?

A. In the Smith incubator, and we have done that ever since we have operated, and not only will I tell you that, but every one of my help, and every one of my organization will tell you the same story.

Q. What percentage do you get from the usage of your own machine?

A. From fifty on up to sixty and sixty-five.

Q. On an average?

A. On an average, but we also base our hatches in my own incubator around 50 to 55 and 60 per cent. We have found in the operation of my incubator, they are claiming very good hatching.

Q. What do you call a good hatch?

A. I call a good hatch 65 to 68 per cent.

Q. What do you call a poor hatch?

A. I would call a poor hatch around 40 per cent.

Q. Were you ever able to get as high a percentage of hatched eggs, with the use of the Smith machine, as you have with your own? A. No.

213 Thereafter, on pages 241-245, inclusive, of the typewritten trial record, this witness testified to the following effect, to-wit:

That in the season of 1928-1929, he had used, at Sleepy Eye, Minnesota, a specimen of the Boling incubator. States that date from memory only. Being asked to describe that incubator, he says that it was an incubator with a corridor and trays on both sides, with the trays at different levels. Thinks

the trays held about 220 eggs each. There was a fan in the corridor, which blew the air toward the top of the machine, where is was re-circulated and came down through the eggs to the bottom and back to the fan again. The heating element was directly below the fan in the corridor and the circulation of that machine was a forced circulation, something on the principle of the Smith incubator.

He then identified a drawing taken from the transcript of record on appeal to the Sixth Circuit Court of Appeals in a case entitled "Buckeye Incubator Company and Samuel B. Smith, appellants, vs. Bert W. Boling, appellee"; and stated that this drawing correctly illustrates the Boling machine used by him. This drawing was first offered in evidence on page 244 of the trial record, but not there marked; and it was again referred to and reoffered in evidence on page 615 of the trial record and marked "Defendant's Exhibit U, Drawing entitled 'Incubator of E. H. Snow, Sleepy Eye, Minn.' ".

214 E. H. Snow's Testimony, Under Cross-Examination. (pp. 245-267).

States that his steam-heated incubator, located at Sleepy Eye, Minnesota, was the first machine of that type made by him, and thinks that this was built in the fore part of the year 1929, but cannot fix the date exactly. Says that Sleepy Eye machine has the numeral 1 on the door thereof. Can't state whether he first used that machine in 1929 or 1930. Repeats that he built three more steam-heated machines, but can't remember the dates.

Says he tried out his first incubator before he built any more, and that he always tried out each new incubator made by him. Cannot remember how many hatches he made on his first steam-heated incubator, before he continued to make more, but he made several. Being asked what season it was when his first steam-heated incubator was run, Snow states that it was either in 1929 or in 1930, the last part of the year. Says that three of those steam-heated incubators are located at Sleepy Eye and another one is located at Montevideo, Minnesota, and that they each have a capacity of about 45,000 eggs. Being then asked how many electrical machines he had built (means electrically heated incubators), Snow answered that he would have to count them up, but something like a dozen. Says one is located at New Ulm, Minnesota, another at Tracy, two at Canby, two at Worthington, one at Faribault, two at St. Cloud, one at Benson, one at Litchfield, and one at Sauk Center, all in Minnesota.

215 These electrical machines ordinarily hold each 45,000 eggs, but, with extra trays put in, can be made to hold about 48,000.

Being asked whether the various hatcheries that he had designated were operated by him. Snow answered "Not altogether". Says that he had certain connections with them. Says there were some of the hatcheries run in his name, but were not his own hatcheries, but that he was interested in more or less of them, because of the way in which he sold the incubators. Being asked how many thereof he owned and operated in Minnesota, South Dakota and other places of the United States, Snow said he would have to count them up. He then said that he had twelve main plants and was interested in five more, as he sold his incubators under conditional contracts, under which the incubators belonged to him until they were fully paid for by the purchasers thereof. Says he holds mortgages on the incubators sold until paid for. Says he don't own twelve plants himself. Says he owns the two at New Ulm and one at Faribault, which are run under the names "Snow's Hatcheries". Says there are three incubators at Sleepy Eye. Says he owns the hatchery at Mankato, but uses there the Smith incubators. Says he owns another plant at Tracy, where he has two incubators, and another at Marshall, where he has an electrically heated incubator. At Montevideo, there is one of his steam-heated incubators and two Smith incubators, and then he has a hatchery at Canby, where he has one of his electrically heated incubators. Then, at Worthington, Minnesota, he has one of his electrically heated incubators and two of his team-heated incubators. Says there are two Smith incubators at Brookings, South Dakota.

216 Says he has a hatchery at Marshall, Minnesota, where he employs three Smith incubators. Says the hatchery at Faribault, belongs to his daughter. Says the one at St. Cloud belongs to himself, and that he has there two electrically heated incubators and one Smith. In respect to Sauk Center, he does not run that hatchery, but is selling an incubator there. States that he has now named all of the hatcheries owned or operated by him, or wherein he has any interest, to the best of his knowledge. Says he don't want to keep anything out.

Then his further testimony, under cross-examination, pages 261 to 267, inclusive, of typewritten trial record, is as follows:—

"Q. Now, I am asking you, Mr. Snow, did you ever build machines at Sleepy Eye where you put the fans at the top of the corridor?

A. I built a test machine at Sleepy Eye.

Q. With the same size cabinet as the Smith machine?

A. No, not exactly. Could—can I answer this to the best of my ability. I built a machine at Sleepy Eye with fans in it for the purpose of testing out to my satisfaction
217 whether it was necessary to lower down the eggs in this said Smith incubator and I put the fans overhead to make that test.

Q. And you built two machines like that, didn't you?

A. I built two machines and tore them down—tore down the machines.

Q. With the fans over the center of the corridors, that is right, isn't it?

A. I didn't build two—I built the machines and tore them down as far as that was concerned.

Q. But you built them?

A. I wouldn't say I built two.

Q. You did build them, did you not?

A. I wouldn't say I built two.

Q. You operated those machines at Sleepy Eye under lock and key in a cellar, did you not? A. I did not.

Q. You didn't?

A. I didn't run them under no lock and key.

Q. You run them down in the cellar?

A. I run this one incubator to prove to my satisfaction, to prove how eggs hatched when they were lowered.

Q. You didn't show us that machine when we were at Sleepy Eye. Why?

A. You didn't ask to see it.

Q. We asked you if you had any other machines. Do you remember that?

A. Those machines were dismantled. Those machines
218 or machine rather, was put up, and used in all different phases and tore down and reassembled in all different phases; was what you would call my test incubator, and I put fans blowing air up, as I said before here on the stand; I put fans and blew the air down, as I said here before on the stand; and I blew air sideways and what not.

Q. And you ran those incubators commercially in the cellar of your plant, did you not?

A. I used it for a test.

Q. You used it commercially, did you not?

A. I used it for a test on hatching eggs. It turned out to be a flop and failure.

Q. How long did you use it?
A. I don't remember.

Mr. Williamson: The witness is instructed, Your Honor, if he has any records with him in regard to any of these things he can refer to them before he answers these questions.

The Court: Oh yes.

Q. Now, those air inlets in your machines are adjustable, are they not? A. The what?
Q. The air inlets and outlets in your machines are adjusable, are they not? A. Yes, sir.
Q. And to what diameter of air inlet?
219 A. It is around inch and three-quarters to two inches, right in there, around two inches.
Q. And that is covered by a trough in which you have some gates so that you can adjust the amount of air that comes in? A. Yes.
Q. And the air outlets in the top of the machine, how big are those?
A. They are around seven inches, somewhere along there.
Q. And you have got a slide that goes over it?
A. Yes.
Q. And you can open it the whole way so that the whole opening can be exposed?
A. Yes.
Q. As I understand it, in the Smith machine, according to your experience, that the air must have sufficient velocity to get down to the eggs at the bottom of the corridor, is that right? A. Yes.
Q. And if air of sufficient velocity is provided to get down to the eggs in the lower part of the corridor they will hatch properly, is that right?
A. Oh, not necessarily.
Q. Now, I understand then in your machine you have an even temperature, you say, throughout, is that right?

Mr. Williamson: I can't hear your question here myself.

220 Mr. Ely: I beg your pardon.

Q. You have an even temperature throughout your machine, you say?
A. We try to maintain an even temperature.
Q. What is that temperature?
A. We try to maintain a temperature of approximately 99-¼.

Q. And you circulate the air about the machine so that you will get no hot or cold spots?

A. We agitate the air throughout the entire incubator.

Q. So that you will get no hot or cold spots?

A. We aim to have no hot or cold spots.

Q. And the air is then diffused throughout the machine so it has the same temperature, that is right, isn't it?

A. It is diffused to a certain extent.

Q. Well, it is diffused sufficiently so as to have the same temperature throughout the machine, is it not?

A. It has—diffuse the air to maintain an even temperature throughout the entire incubator.

Q. And that air passes over hot and cold eggs, doesn't it?

A. That air passes over all of the eggs most likely but—well, I would say it passes over and under.

Q. All of the eggs?

A. Over and under, yes.

Q. All of the eggs in the incubator? A. Yes.

Q. And it goes in a horizontal path?

221 A. More of a horizontal path than otherwise.

Q. And it goes on horizontal paths, out along the ceiling and side walls?

A. There is a greater circulation around the ceiling and on the walls, which I aim to get; was one of the main factors in that incubator.

Q. That goes in a horizontal path?

A. The air on the side of the incubator moves which way the wall is, because the wall would reflect—it couldn't go right through the wall and would naturally have to go around the wall, which I aim to get, is one of the main features of my incubator.

Q. That follows the wall as it leaves the fan, follows the wall and the ceiling?

A. To a certain extent.

Q. It does, does it not?

A. Not all of the air, just a certain percentage of the air.

Q. It goes in a horizontal path through the egg trays?

A. We aim to have a good portion of it move horizontally. That is the feature of that incubator.

Q. And when it is moving horizontally it moves in the same direction all of the time, does it not?

A. No, it don't.

Q. At any one point?

Mr. Williamson: Did you get his answer?

222 Mr. Ely: He said no.

(The answer read by the reporter, "No, it don't.")

Q. At any one point it moves in the same direction all of the time, doesn't it?

A. I wouldn't say it moves at the one point the same all of the time. It is agitated so that it goes all in which directions, but is agitated more on a horizontal plane than any other.

Q. You know that the air, as it goes through the hatching trays in front of the fans, moves in a horizontal direction continuously, in the same direction towards the fan. Now, you know that, don't you?

A. It may move—it may move in a horizontal plane—horizontal plane to the eye of the agitator. It may do that.

Q. And it does that today, and it will do that tomorrow, and it will do it every time you go in the machine, will it not? A. Yes, I suppose so.

Q. It will, won't it? A. Yes.

Mr. Ely: That is all, Your Honor.

223 E. H. Snow's Testimony, Under Redirect Examination.

His redirect examination begun on page 267 and continued through to near the end of page 277 and the continued part of it was as follows:

Redirect Examination.

By Mr. Williamson:

Q. Just a minute. Mr. Snow, have you got here with you your records as to the time when you built these va-
224 rious machines and the places where you sold them and put them into use? Have you got the records here with you?

A. I don't think so.

Q. Before taking the stand had you refreshed your memory at all by reference to records with respect to these dates—

A. No.

Q. —Mr. Ely was asking you about?

A. No.

Q. Are there any of those records here in the city where you could get at them?

A. No.

Q. How long ago was it that you made that experimental model of the Smith machine that Mr. Ely asked you about?

A. That was along in the year of about—in the years along in—along the year of 1926.

Q. Over six years ago?

(Preceding question is read by the reporter.)

A. It was along in the year of 1926.

Q. Have you got any record with you by which you can fix that?

A. No.

Q. Have you a record which you can get accessible before the close of this case?

A. Well, I wouldn't have any records of it any more than what we know.

Q. Well, have you any way, or do you have any fixing
225 the date, exactly fixing the date, otherwise than by memory? You have fixed it by memory now, haven't you, your best recollection?

A. Yes.

Q. Have you got any records?

A. I would have to investigate.

Q. I will ask you to investigate and we will call you at some future time to fix that date better.

(Witness excused.)

Mr. Williamson: Now, Your Honor, we would like to have you see our machines. They are right here in the ground floor of the Flour Exchange, and if we could take an early adjournment I think we might show you these machines, if you are willing to meet us down there, and it would be very helpful to you when you listen to Dr. Rowley's testimony to see those machines first.

The Court: We can go right down now.

Mr. Williamson: We would like to have Professor Rowley make a few tests there while you are present so as to make clear how these tests are conducted. Of course, we are not going to attempt to hold you there to cause the elaborate tests to be made that were made, but let him make a few tests just to show you what tests he did make, just to see how the tests were conducted. Of course, I can put him on the stand and go on with certain matters before we go down, or go down now or at any hour you are willing to go.

Mr. Ely: I object to the demonstration. I object to
226 any showing of that electrical machine down there, the Snow machine, for two reasons; in the first place, the fans are not the same as the fans at Sleepy Eye. You will recall Mr. Snow testified very carefully he brought everything from Sleepy Eye down with him except the fans and the fans are four inches less in diameter and therefore 15 per cent less in effective area than the other fans which

he used, and Mr. Snow said himself he had never used that machine that is down there.

Mr. Williamson: For hatching eggs. He said he used it for demonstrating purposes.

Mr. Ely: That is all right. He can demonstrate it all he wants to. Furthermore those fans are run, not only at different speeds from the speed of the fans at Sleepy Eye, but one is run at 225 and the other is run at 185 revolutions per minute, which greatly upsets the current regulation, so you won't get any definite idea of what Mr. Snow has done with that machine. And I object to any tests or any statements of Mr. Snow in reference to that machine.

Mr. Williamson: That is a radical misstatement. Mr. Snow has testified this machine down here is identical in structure with four other machines he put into commercial use and he testified he used this identical machine for demonstrations in making sales to customers and it is perfectly obvious—and this machine was made, he has testified it was made within the jurisdiction of this Court, and that
227 machine, having been made in the jurisdiction of this Court, we have a right to put it in as a machine made by us and make tests with it, whether there was any difference between that machine or other machines or not. We are not tied up by that machine that was in the basement of the Sleepy Eye plant.

Mr. Ely: I think you are:

Mr. Williamson: No, not anything of the kind. You went up there at your own request, out of courtesy from me, to see that machine. We have been willing to stipulate our machines all along the line. If you had asked me to stipulate that Sleepy Eye machine, I would have stipulated that, but that had to stay there because we couldn't take it out. If you had asked me to stipulate the machine down here, we could have stipulated that and saved a lot of time.

The Court: I think I will go and see the machine and have the tests. What that will play in the suit, of course I don't know.

Mr. Ely: Of course, I want to caution Your Honor that the fans are not the same.

The Court: He claims they are. What part that plays in this case will depend upon.

Mr. Williamson. When do you want to go?

The Court: It is now 12 o'clock. How long will it take?

Mr. Williamson: Oh, it will take about half an hour.

228 The Court: Then we will go down now.

(The Court and counsel and Mr. Taggart and Mr. Rowley and Mr. Snow together with the reporter then proceeded to 323 Third Street South, where the Court inspected two incubators, having certain tests made in the Snow incubator by Professor Rowley.)

(Adjournment taken until 2 o'clock P. M. November 18, 1932.)

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229 November 18, 1932,

At 2 o'clock p. m.

Hearing resumed pursuant to adjournment.

Court and counsel present.

Mr. Williamson: I will recall the witness, Mr. E. H. Snow.

EARL H. SNOW, recalled, testified as follows:

Direct Examination.

By Mr. Williamson:

Q. Mr. Snow, since you were last on the stand, did His Honor, Judge Molyneaux, go with you and counsel for the parties down to the place where you have your specimen of the Smith machine, and the specimen of your own machine, on the ground floor of the Flour Exchange, to see these machines?

A. Yes, sir.

Q. When you were before on the stand, I forgot to ask you one question, and I don't think you spoke about it anywhere in your testimony. In the handling of the eggs in the Smith incubator, and in your own incubator, do you turn those eggs every day?

A. Yes, we aim to turn them two or three times a day.

Q. How do you effect that turning of these eggs?

A. You turn the entire tray.

Q. Well, how far do you turn it?

A. Well, they recommend, on their machine, to turn
230 it close to forty-five degrees or about forty-five degrees.

Q. That is on the Smith machine?

A. Yes, sir. And on my machine it is not necessary, and I don't recommend turning them that far.

Q. How far do you turn them?

A. Well, around,—in the neighborhood of thirty degrees, somewhere in there.

Q. What effect does that have on the eggs; what does it do for the eggs,—that is, by turning the eggs?

A. It turns the eggs as much as,—the elements inside of the egg shell,—to keep the elements, in other words, from growing tight to the embryo, or to the particles of the shell inside.

Q. The embryo inside shifts, does it?

A. Yes, sir.

Q. Have you had any experience in observing how the hen handles her own eggs?

A. Yes, sir.

Q. Have you made any study of them?

A. Yes, sir.

Q. Does she, as a matter of fact, according to your observation, turn the eggs?

A. Yes, sir.

Q. How does she do that?

A. She turns the eggs with her bill.

Q. How often?

231 A. She turns them, to the best of our knowledge, and to my best knowledge of everything else concerned, two and three times a day.

Q. In your experience with incubating machines, both of these makes and other makes, has there been an attempt on the part of manufacturers of incubators, users of incubators, to imitate the practice of the hen as nearly as is practicable?

A. Yes, sir.

Q. What is your observation of the way a hen handles her own eggs; does she leave those eggs during the day?

A. She leaves them, as a rule, to get something to eat.

Q. And while she is away, do these eggs naturally cool off to some extent? A. Yes, they cool off to some extent.

Q. In the incubator business, has there been an attempt made to imitate her in that respect?

A. Well, it was for a long time, but it has been the practice by all incubator companies of late, that it was not necessary to cool the eggs.

Q. So you don't do that any more?

A. No; so we don't do that any more.

Q. That was done in the earlier used machines, was it?

A. It was done in the earlier used machines, yes.

Q. Have you, since you were last on the stand, been able, by reference to some documents, to reliably fix the date

when you bought your first machine from the Smith
232 Incubator Company? A. Yes, sir.

Q. And what date did you find that to have been?

A. That was November 7, 1924.

Q. And when you were on the stand before, you spoke of having made an experimental small sized specimen, somewhat similar to the Smith machine, did you not?

A. Yes, sir.

Q. You were then just speaking from memory, were you not, without any reference to any records? A. Yes, sir.

Q. Have you tried to refresh your memory as to the events now, so as to be able to more reliably fix that date?

A. Yes, sir.

Q. And what do you find the date to have been, and how do you fix it?

A. The date that I built that test machine, that we were talking about, was built a year before I bought my first Smith incubator, and was tested to hatch eggs in, and then was dismantled.

Q. What, if any, had been the relations of your wife, Mrs. Snow, to the conduct of your incubator business, with respect to the handling of the incubators for hatching eggs?

Mr. Ely: Oh, I object to that as immaterial, if Your Honor please.

The Court: I don't see anything there,—

233 Mr. Williamson: (Interrupting) I want to corroborate this date by his wife.

The Court: How is that?

Mr. Williamson: She was intimately related to the handling of these eggs and was in contact with the incubators during that whole period of time, and she can corroborate him on this date of that experimental device; that is all.

The Court: All right. Go ahead.

Mr. Ely: Exception.

A. She knows when I built it.

Q. What were her relations to your business, and in what way does she know your business?

A. She knows my business for the reason that she is with me in practically all of my workings of the hatchery business and so on and so forth.

Q. Does she actually take a part in the hatchery,—of the hatches? A. Yes.

Q. During this whole period of time?
A. Throughout the entire period, since we have been married.

Mr. Williamson: That is all.

234 E. H. Snow's Testimony, under recross examination.

This begun on page 277 and continued to the top portion of page 286, and thereafter his redirect examination occupied pages 286 and 287 of the typewritten trial record, and the said testimony given under recross examination and under redirect examination appears on said pages 277 to 287 of the typewritten trial record, and is here reproduced in full, to-wit:—

Cross-Examination.

By Mr. Ely:
Q. How many of those experimental machines did you build before you bought your first Smith machine?
A. One.
235 Q. Only one? A. One.
Q. Is that the machine referred to in your letter of October, 1924, that you identified while you were on the stand before? A. No.
Q. Then you built more than one? A. I can explain that.
Q. (interrupting) No. Then you built more than one?
A. I built a different kind of incubator.
Q. I asked you whether you built more than one, and you said you only built one machine, before you bought the Smith machine?
A. I built one incubator, a cabinet incubator, one test cabinet incubator, before I bought my Smith,—one test cabinet incubator.
Q. Well, I cannot seem to get a straight answer. Now, Mr. Snow, did you build any other machines after you bought your first Smith incubator, up to the time that you built this one that we saw?
A. Yes; I experimented with lots and lots of them.
Q. And you built three machines with the fans in the top of the machine, did you not? A. Not necessarily, no.
Q. Did you build three machines?

The Court: Counsel did not ask you whether you
236 built it necessarily; you can answer that direct.

A. No.

By Mr. Ely:
Q. You know that you built three machines with a fan in the top of the corridor?

A. Now, if I can answer that right: I built to try out,—I did not try them out,—I built and tore them down.

Q. How many? A. I don't just know the number.

Q. Now, just a minute. Did you not build three machines, three incubators with the fans in the top of the corridor, and operate them commercially in the cellar of your hatchery at Sleepy Eye, between the years 1925 and 1929?

A. Not to the best of my knowledge.

Q. Now, wait a minute. That is a perfectly fair question and I think you can answer it.

A. I don't remember, no; not to the best of my knowledge.

Q. You deny that you did?

The Court: Well, I take it for granted that when he says that, that he denies that he did.

Mr. Williamson: That is right.

The Court: I could not place any other interpretation upon it.

By Mr. Ely:

Q. In your incubator at Sleepy Eye, you had two Smiths, did you not? A. In my incubator?

Q. I mean, in your hatchery at Sleepy Eye you had two Smiths?

237 A. Yes.

Q. And you operated those on the first floor?

A. Yes, sir.

Q. Did you, during the years from 1925 to 1929,—did you operate any incubators in the cellar?

A. I,—not to the best of my knowledge.

Q. You don't remember whether you did or not?

A. Not to the best of my knowledge.

Q. You don't remember whether you had any incubators in the cellar that were operated commercially during that time?

A. Not to the best of my knowledge, I would not.

Q. Now, in that cellar of yours, you come down a step and in the room to the right is where we saw the machine which is known as the Sleepy Eye machine, that is right, isn't it? A. Known as what?

Q. The one that we saw. A. Yes, to the right.

Q. And to the left there is another room?

A. Yes; that is a different building.

Q. But it connects through a door? A. Yes.

Q. Do you remember whether you had any incubators in commercial operation in the cellar, in the room at the left; do you remember that? A. At that time?

238 Q. Yes. A. No.

Q. From 1925 to 1929?

A. No; not to the best of my knowledge.

Q. At any time?

A. Not to the best of my knowledge.

Q. Do you remember whether you had produced chicks and sold them commercially in machines which you were operating in that portion of the cellar at the left, behind the door, and behind lock and key; do you remember that?

A. I used that as a test; that is what that was for, and that is what the incubator was built for.

Q. Now, there were three incubators, were there not?

A. There was one,—there was one built, one incubator for a test model.

Q. Then you did have an incubator in Sleepy Eye,—

A. (Interrupting) And that incubator that I built for a test model was dismantled. The incubator that I built after that one was of different construction and operated differently.

Q. For how long a period did you operate it as a test?

A. Operate it as a test?

Q. Yes.

A. I operated tests on these machines in different ways, ever since 1909.

Q. Well, let us not go back to 1909. I am asking you

239 about the period from 1925 to 1929.

Mr. Williamson: That was not in your question.

Mr. Ely: Well, that is what I am talking about; it was in my previous question.

By Mr. Ely:

Q. How long did you operate it?

A. I don't remember exactly how long I operated any test machine, because it was merely to bring out the method in which I could prove to myself was the best method of incubation.

Q. Did you sell the chicks off of this machine?

A. As far as,—I don't remember how many chicks came off of that machine, or whether I sold them or not.

Q. You made no record of them?

A. I have not made a record of them.

Q. You don't remember that you operated these machines in the basement, under lock and key, during the period that we have been discussing, from 1925 to 1929?

A. I don't remember of that at all.

Q. You went to Europe, didn't you, to a chick convention?

A. Yes, sir.

Q. When was that,—in London?

A. In 1930,—I don't remember.

Q. In 1929, wasn't it? A. 1929, was it?

Q. Was it '29,—it was 1930, wasn't it? A. Yes.

Q. Well, at any rate, you went to a convention,—
240 you went to a chick convention in 1930,—that is right, isn't it? A. Somewheres in there.

Q. Didn't you write a letter back to your secretary, to lock that part of the cellar, and not let anybody in?

Mr. Williamson: That is objected to as immaterial.

A. Oh, I don't know; I don't remember; I might have, because that was my experimental place; I might have.

Q. And you did send such a letter, didn't you?

A. I don't know; it might have been; I don't know.

Q. You don't remember?

A. I don't remember. Of course, it may have been possible, because that was my experimental incubator, where I tested out and worked, and tore down and rebuilt.

Q. And you did not sell any chicks from that?

A. I don't remember; I cannot recall with reference to the chicks, whether I sold the chicks out of that machine, or whether they were from other machines.

Q. And you don't remember whether you operated those commercially or not?

A. I made one of them,—because they were changed about so many different times,—I changed those machines every time I got a different idea. As I said before, it was my experimental incubator.

Q. What do you mean by the word "experimental"?

A. Experimental was where I was testing out to my
241 satisfaction, when I built it, like a man trying to make an invention; he cannot go to work and just say, "I can invent a typewriter, and make it." I had to try out an experiment, to satisfy myself, with the eggs, and find out how it would work, and which I did.

Q. If you operated this incubator for three or four years, and sold the product, and sold those chicks, you would still call that experimental?

A. This incubator was never run any length of time in the same manner.

Q. Will you please answer my question?
Q. What is the question?

(Previous question read by the reporter.)

A. I don't know; it would depend on how many times you change the incubator.
Q. I asked you a question; will you please answer the question; I want to know what you mean by experimental?
A. Experimental is where you build and rebuild an incubator, and test it out.
Q. Yes, but you had three incubators down there, didn't you?
A. I worked on different incubators down there at all times.
Q. Didn't you have three incubators at one time operating down there?
A. I don't think there was any of that kind operating at any one time,—not that I remember.
242 Q. Do you know a Miss Lena Laux? A. Yes, sir.
Q. Who is she?
A. She is a lady that was at Sleepy Eye.
Q. How long did she work for you?
A. I don't remember.
Q. Don't you recall how long she worked for you?
A. How?
Q. Don't you recall how long she worked for you?
A. She worked for me for a few years, off and on; she did not work all the while, steady.
Q. What was the greatest number of incubators that you had operating at one time, from 1925 to 1929, at Sleepy Eye?
A. What was that?

Mr. Williamson: That is objected to as immaterial. I cannot see the materiality of it.

The Court: The objection is overruled.

Mr. Williamson: Note an exception.

A. I did not get what you said.

(Previous question read by the reporter.)

A. To the best of my knowledge, in and about that time, we were running two incubators.
Q. That is the very best answer that you can give?
A. That is, to the best of my knowledge.
Q. That is the best answer you can give?
A. That is the best answer I can give you.
243 Q. And what were those two?
A. They were Smith incubators.

Q. They were the ones that were up on the first floor?
A. Yes, sir.

Mr. Ely: That is all.

Redirect Examination.

By Mr. Williamson:

Q. One more question or two: You stated when you were on the stand this forenoon, and, I think, yesterday, that you had made and sold a number of your electrically heated incubators, did you not? A. Yes, sir.

Q. Wait a minute,—and under cross-examination by Mr. Ely you specified the locations where those machines were being sold, did you not? A. Yes, sir.

Q. Now, I will ask you to state whether or not all those electrically heated incubators of yours that you identified,—

A. (interrupting) Yes, sir.

Q. (continuing) —that had been sold by you—

A. (interrupting) Yes, sir.

Q. (continuing) —were substantially like this machine, this electrically heated machine that you have got down here now on the main floor of the Flour Exchange?

A. Identically the same incubator.

Q. Were they the same in all respects?

244 A. The same in all respects.

Q. In structure? A. In structure.

Q. And in the mode of operation?

A. And in the mode of operation.

Q. How about the size of the fans?

A. Exactly the same size.

Q. How about the speed at which they run?

A. Exactly the same speed. There is no difference whatsoever in the incubators that I have running at the plant, that I mentioned here before,—only to improve them as electrical incubators are developed;—they are the same from A to Z as the incubator in the Flour Exchange.

Mr. Williamson: That is all.

Mr. Ely: That is all.

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245 Nora Snow's Testimony.

Nora Snow, a witness called on behalf of the defendant, being first duly sworn, testified, on pages 288 and 289 of the typewritten trial record to the following effect, to-wit:

States that she is the wife of Mr. E. H. Snow and is forty-two years of age, and being asked to state what her relation

to her husband had been in the conduct of his incubator business, she stated that she had been with him as much as she possibly could when her family duties so allowed. Says that she actually helped him to run his business to a greater or less extent. Said she kept track of the business. Says that she kept the books.

States that she heard Mr. Snow testify about his experimental machine, which was more or less like the Smith machine, and that she remembers that event. Then being asked to fix the time when it occurred, she answered

"It was the year before we bought our first Smith machine."

Being asked how she was able to fix that date, she answers that it was a matter of memory with her and she is positive that it was before he bought his first Smith machine.

There was no cross-examination.

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246 Professor Frank B. Rowley's Testimony.

Professor Frank B. Rowley, called as a mechanical expert witness on behalf of the defendant, having been first duly sworn, testified to the following effect, a portion of his testimony being here reproduced in narrative form, but most of it in full.

Under Direct Examination.

He states that he is fifty years of age and that he is a resident of Minneapolis, Minnesota, residing at 63 Barton Avenue. States that he is Professor of Mechanical Engineering, and Director of the Experimental Engineering Laboratories of the University of Minnesota. Has so acted since the spring of 1919, but has been with the said University since 1907. Was first an instructor in drawing and descriptive geometry. Was transferred to the Experimental Engineering Laboratories in 1916. Then, in 1917, his title was changed to Assistant Professor, and then, a year or two later, to Associate Professor, and then to Professor and Director of Laboratories.

Being asked what subjects he teaches at the University, he answered that his specific subjects are heating and ventilation and refrigeration, but that when he first went there, he taught drawing, descriptive geometry and designs, and has taught general engineering courses, including heat engines, and internal combustion engines, and has had complete charge of heating and ventilation and research work.

That he graduated from the University of Wisconsin,
247 Mechanical Engineering Department, in 1905, with the degree of Bachelor of Science, and then took one year's graduate work and received the Mechanical Engineer's degree in 1906. Then he was on private engineering work for one year, and then came to the University of Minnesota in 1907, and since then, in addition to his University duties, he has carried on a consulting practice in engineering. Has made many tests and investigations on heating and ventilating apparatus, contact driers, insulation driers, and practically all types of heating and ventilating apparatus, including oil burners, boilers, warm air furnaces, humidifiers, etc. He has made many investigations and tests for the Minnesota State Securities Commission. Has conducted a large amount of research work in relation to heat transmission and ventilation. He is a member of the Sigma XI and the Pi Tau Sigma Society. He is a member of many Engineering Societies, including the American Society of American Engineering, the American Society of Heating & Ventilating Engineers, the Society for the Promotion of Engineering Education, the Minnesota Federation of Architectural and Engineering Societies. He is, at the present time, the National President of the American Society of Heating & Ventilating Engineers, and was previously Vice President and Chairman of the Research Committee. He is also Chairman of the Technical Advisory Committee of that Society, and a member of the National Committee on Heating and Heating Transmission. He is also a member of the Department of Commerce Committee on Wood Utilization. He has delivered many lectures on heating and ventilation throughout the country and written many papers on that subject, published by the University Press.

He has had many cases in his work where it was neces-
248 sary for him to read and understand patents, with a view of determining the disclosures thereof and how the things disclosed would operate, and has acted as an expert witness and had experience in constructing machines and supervising the construction of machines, in accordance with the disclosure of patents relating to such machines.

Says he is himself a draftsman and has taught the subject.

States that he is not interested in any way in the result of this litigation and is not related by blood or marriage to the defendant or the defendant's wife.

His further testimony, under direct examination, runs from page 295 to the middle of page 489, of the typewritten trial record, which is here reproduced in full, and the record of his

cross-examination runs from the middle of page 489 to page 606 of the trial record and is here reproduced in full, and the record of his redirect examination runs from page 607 to the middle of page 616 of the typewritten trial record, which is also here reproduced in full.

249 Q. I show you here a copy of the Smith patent in suit, Number 1,262,860, of April 16, 1918, and ask you to state whether you have read and understand the disclosure of that patent? A. I have.

Q. Do you understand the disclosure of that patent?

A. I do.

Q. Please state, Professor, in your own way, what you understand the disclosure of that patent to be?

A. The disclosure in the plans and specifications,—in the drawings and specifications, is of an incubator, with double rows or trays, a corridor, with curtains on the sides, and with a fan for circulating the air downward through the corridor, underneath the curtains, where it will be drawn back through the egg trays, to the upper part of the machine, and out.

Now, in describing it in detail,—if we refer to Figure 1, which is a cross section, that probably illustrates it as well as any.

Q. Speak a little louder, Professor, if you will, please.

A. Referring to Figure 1, which is a cross section, the housing, or general casing is illustrated there, as a
250 room, an outside room,—the size is not given, but it is shown,—well I think numeral "6" indicates that; at any rate, that is it.

Now, there are two rows of trays; this is a vertical cross section. There are two tiers, I might say, of trays, one on each side.

In the central part, there is a corridor, and each side of the corridor are curtains, which extend from the top part down to the lower trays.

Now, in the upper part of the corridor, there is really a false ceiling, or a double ceiling there, you might call it, in which there is a fan supported. The fan blades are indicated by the figure "18," and that fan is for the purpose of driving the air downward through the column; from there it passes out under the curtain, and up through the trays, or the egg trays. Part of the eggs are shown in, and most of them are out of the trays.

Now, at the top, there are illustrated two openings by the numeral "28," which are for the purpose of letting out some

of the air which goes through, and there is another opening, a large one, at the central top of the figure, for the purpose of admitting air. That air is admitted and comes down through the valve opening, "24" there (indicating), where it is regulated to let the air into the chamber or corridor over the fan.

251 Now, if we refer to Figure 3, that is a longitudinal vertical section, or a section through the corridor lengthwise.

The fans that are shown in this case are two fans in the central part of the corridor; the curtain, or one part of the curtain, being removed, and the other curtain is in place, but turned back, and it shows the egg trays in a little different position than the other figure.

Now, in the detail there are three stationary trays at the top, and below that there are nine trays that are built or put in a frame that can be tilted or pivoted.

Below those nine trays there are three more shown here as stationary trays, near the bottom of the incubator, between the tiers of trays, there are some flexible strips shown.

Q. You had better give the reference numeral.

A. Well, these strips seem to be shown by numeral "28," and apparently there are two 28's used in this patent; I think that must be an error, but, at any rate, these strips are indicated by the numeral "28" between the lower trays, and those strips pass back through the length of the trays from this section to the back part of the tray, so that they cut off respectively that vertical passage between the tiers of trays.

Now, there is a pipe numeral "26," that is in the upper right hand corner of Figure 3. There is a pipe in there for the purpose of letting in a steam jet for humidity, it acts as a humidifier for the air.

252 There is a motor, of course, to operate the fan shown in Figure 1, and there are two fans, of course, in this particular specification.

Q. There are how many motors?

A. Two motors. At the left side of Figure 3, there is indicated a door for the entrance to the corridor,—a door for entering the central corridor. While those curtains are shown only part way in Figure 3, they are removed only to show the trays; they continue in the apparatus; they should continue clear across the section.

Q. How is it heated,—is there any means for heating?

A. Yes, there are heating pipes shown at the top. In Figure 1, there is shown a pipe number "23," on either side of the fan, along the corridor; and the same is shown in Figure 3, as running lengthwise along the corridor, above the fan support.

I think that describes the machine; that was your question.

Q. As far as the structure is concerned?
A. Yes, sir.
Q. Will you describe the operation of the machine as disclosed by that patent, to which you have been referring, especially with reference to the air circulation?
A. Well, the operation of the machine is as follows: First, omitting the method of filling the trays and lowering them,—I will describe the air circulation.

253 Now, the air is driven by fans in the column, down the central corridor,—between the curtains, to a point near the floor,where it mushrooms out underneath the curtain into the tray compartment. There it filters up through the trays to the space between the trays, up to the upper space above the trays, from where it is drawn in over the beams, or the elements "22," into the fan suction chamber, or into the chamber above the fan. It should be pointed out, above this line "22;" there is an opening there to allow this air to come back above the fan for recirculation.

Now, a part of the air will pass out through "28,"—these openings "28" (indicating), and a part of the new air will come in through the large central opening at the top of the casing. Now, that will depend upon the regulation of the valves controlling those openings.

Q. Are there any valves shown in the patent?
A. There is one, number "24," which I think is a question there,—if it is not meant for a valve,—which I have interpreted as a valve.
Q. Speak a little louder, please.
A. Now, the air of course, is heated by the pipe "23," as called for by the temperature, and circulates on through and continues in the column downward, and vertically up through the tray.

254 Now, referring to Figure 3, as to the method of operation, the eggs are set in the upper three trays. After a preliminary period, I believe, of three days, they are moved downward into the movable or tilting trays. And then, after a further period, they are moved downward still

farther, and so on, until at the end of the eighteenth day, they are taken from the different trays, into the stationary trays underneath, which are called the hatching trays, I believe, or the nursery trays.

The eggs in the tilting trays are tilted at different angles, that is, they are tilted first in one direction, and then in the other, or provision is made for tilting them, to change the position of the egg through the period of hatching.

Now, in the operation of this patent, it describes many places in the specification. The curtains and corridors are mentioned, showing that the direction of the air is downward through the corridor. I have jotted down some of these, to save a little time.

On page one, line 70: "Two parallel rows of curtains '3' and '4', to provide a central compartment or corridor '5', and side compartments '6' and '7.' Entrance to the corridor,"—and so forth.

Now, at page two, line 21: "behind the curtains '3' and '4', and these curtains extend a sufficient distance, as indicated in figure 1, to cause the heated air distributed by the fans to pass downwardly through the central corridor to a point near the bottom of the chamber," which indicates that the curtains were there for that purpose.

Further on, on page two, line 53: "In Figure 3 only a
255 single curtain '3' is shown in place, the curtain or curtains at the right being entirely removed to disclose the racks and trays in full lines."

Now, as to the column of air, the column of air or the direction of motion, of course, the curtains indicate and show very clearly the direction of motion, but quoting from the patent, at page two, line 78,—I think that is line 79, pardon me,—

Q. Line 79.

A. Yes, line 79: "It, therefore, appears that the approved apparatus and method contemplates the application of hot air circulating in a column with such speed as to keep the temperature,"—and so on. The column of air,—

Q. (interrupting) Read all of that.

A. "With such speed as to keep the temperature substantially uniform and so arranging the eggs that the fresh eggs are placed at one point in the column of air and held in a horizontal plane until they reach a pre-determined stage of incubation, and then put at a different point in the same column of air and kept in planes inclined to the horizontal

and thereafter placed at such a point in the column of air that the forced draft of air acts to hold the eggs at a uniform temperature, and to prevent them from becoming over heated, and thereafter placing the eggs into final position for the hatching operation."

256 A. (Continued) Now, on page 1, line 28, it states again that the same column of air. Now as to the intent or description, disclosure, for the moving of eggs downward, or the progress through the incubator, on page 1, line 20—where it starts on line 19, "This improved system contemplates that the fresh eggs will be placed in a horizontal plane preferably by means of the trays supported in horizontal planes and after the eggs have been subjected to the circulation of hot air for a predetermined time, the air circulating largely around the eggs, they will be placed in a tilted or inclined position in a different location, but still subject to the same column of air." I might read a little further there: "And at this period of incubation they will be tilted in different planes at regular intervals during the time they remain in the latter position, and after they remain for a predetermined time they will be again moved to a different position with reference to the forced circulation of hot air and so placed therein that the air will tend to keep the eggs below 105 degrees temperature and in this last named position the air will be forced to pass between the different eggs and will, in effect, act as a cooling medium for the eggs." Now that is describing the last position of those eggs as they move downward and of course the effect of the strips which I have referred to would force the air through the eggs, up through those eggs in the advanced stages. Now it was evident that the air is to circulate around the eggs, line

257 25, "The air circulating largely around the eggs." Line 25, page 1. Line 28, page 2. Quoting from there: "As explained later the trays near the bottom are preferably arranged so that the air is forced to pass between the eggs in each tray thereby cooling or holding the temperature of those eggs down," indicating that those eggs in the lower trays are the high temperature eggs and it is the intention to pass the air through those, around the eggs themselves, not through the columns, but around the eggs, to keep it down—to keep the temperature down.

I think I referred to those flexible strips on line 59, page 2. If I didn't they are referred to again there for that same purpose.

Now I haven't said anything about, in this operation, the humidity, but it is understood that humidity comes in through

the steam feed. Humidity is provided through the steam feed which is controlled by hand in this case. It states that any suitable thermostatic means may be employed for regulating the temperature, which of course is expected. I think that describes the operation of it.

Q. I call your attention to the paragraph beginning with line 53, on page 2 of the specifications, and ask you to make clear to the Court what is being referred to there in that paragraph.

A. That paragraph in Figure 3, only a single curtain 3, is shown in place. That refers to Figure 3 over here which says only part of the curtains were in place and really that
258 figure has part or the right hand side of the curtains removed in order to show the trays in open, full view. That refers specifically to that cut.

Q. Does it state the purpose of the parts to which you previously called attention, and which are marked with the numeral 28?

A. Yes, it states further there, "and it will be also noted that the vertical spaces 27 between the adjacent tilting racks 10 are closed at their lower ends by flexible strips of fabric which are attached to and extend upward at each side of each rack so as to compel the air to circulate through the mesh bottom and around and about each egg as heretofore referred to and as the eggs further advanced in incubation"—I don't think that is pertinent to this point.

Q. Well, you want this copy?

A. Well, I can read the rest of it. I don't think it is pertinent to it. I will read the rest of it: "And as the eggs further advanced in incubation are contained in these lower trays and as the danger is that the temperature will rise in these eggs to a point injurious to incubation the improved method disclosed herein permits the circulating air to act as a medium to prevent the over heating at this stage of incubation and this is accomplished by promoting an induced draft within the lower trays." Of course the purpose of those strips there, which are there, and the whole function as described here, those strips are there to compel the
259 air to pass in and about the eggs in those lower trays and the method described of incubation or of hatching, rather, whereby the eggs in the advanced stage of incubation are at the bottom of the tiers, means that the hot eggs are down there and those strips are put in there to force the air up through to cool those eggs from the bottom up.

Q. What then do you understand to be the method of hatching eggs disclosed in the Smith patent in suit and pointed out in claims 1 and 2 of the patent?

Mr. Ely: Oh, I beg your pardon. I object to that, Your Honor. I don't think a lawyer may ask his expert to interpret the claims. I think that is the duty of the Court.

Mr. Williamson: I will change it so as to leave "pointing the claims" out of it.

Q. What do you understand the method of hatching eggs to be disclosed in this patent, the Smith patent here in suit?

A. The method, as the method of operation, is to put the eggs in an incubator, to put—to put them in at different periods progressing downward. That is, the eggs are to be partly set at one time and part at the other, continuously, and they are to be moved downward in the incubator and the current or column of air is to move downward in a free space, then up through the column of the incubating eggs and eggs are moved progressively downward. The air comes up through the lower eggs for the purpose of cooling
260 them with circulation. Now, that is the method, I suppose. That is what I have been—The other things in here, of course the method is to prevent—to furnish a certain amount of fresh air and conserve the moisture and to create a current of air in there that is of sufficient velocity to drive that air around through the incubator. I may not have understood the question but that is what I interpret the meaning of method of operation.

Q. State whether or not in your judgment the curtains, marked with numerals 3 and 4, as shown in figures—as shown best in figure 1 of the drawings of the patent are essential elements to carry into effect the method of hatching eggs disclosed in that patent.

A. They are.

Q. State why.

A. If those curtains weren't in there, those fans would circulate the air downward. The current of air will naturally take the path of least resistance and those currents of air or that column of air from the fan would separate and pass through the upper trays and not pass down to the bottom. In other words, if those curtains were removed instead of having a column of air passing down the corridor to the bottom, that air is going to fan out and creep into the trays up in the upper trays all along the corridor. There would be no defined channel for the column.

The Court: Wouldn't those fans throw the air clear to the bottom?

261 The Witness: Part of the air might go to the bottom, but a lot of it would branch off to the side. Now air, when it is blown out into an open space is not going to follow a column or a stream, only for a very short time, and especially a fan of that type, it couldn't—if you were going to project that air current to the bottom, it would then have to be at an extremely high velocity, that is compared to what we were thinking of on the fan, otherwise it would turn out and into the trays.

Q. How about the question of the power of the fan and the speed of the fan for affecting this circulation?

A. If you are going to have sufficient pressure of the fan to cause that circulation—I understand your question without the curtains?

Q. No, with the curtains.

A. Oh, with the curtains?

Q. Certainly, with or without the curtains. How important is the question of speed of fans to force this air down through the columns and the velocity at which the air moves?

A. It is a question of moving the column of air downward. Now, if you move that air column downward with a large number of fans so the whole column is going downward, then you could have a slow velocity with confined curtains and that volume of air would move to the bottom. Now, if you attempt to move that air down without the curtains in columns, then in order to move it down you have got to have a high velocity current in order to get to
262 the bottom.

Q. The current would turn off to the sides, wouldn't it?

A. It would turn off to the sides.

Q. Instead of all going to the bottom?

A. Yes, unless you inject a high velocity current in there, entirely different than these currents are.

Q. Have you seen and inspected and tested any specimens of this Smith machine disclosed here in this patent?

A. I have.

Q. Where and when and in whose possession?

A. The machine, I suppose it was in Mr. Snow's possession, down at 323 South Third Street.

Q. In the Flour Exchange?

A. Flour Exchange Building.

Q. First floor?

A. First floor of the Flour Exchange.

Q. Please state whether or not you saw that machine actually operated at that place?

A. Yes, operated without eggs, of course.

Q. What is that?

A. Operated without eggs in it.

Q. Yes, without eggs in it. For what purpose was it operated at the time you saw it?

A. Operated to show the circulation of the air in the machine.

Q. And was that done in the presence of counsel for
263 the plaintiff in this case?

A. It was.

Q. And did you make a series of tests with it at that time?

A. I did.

Q. State whether or not that machine, as you saw it there at the time you have referred to, was exactly like the machine disclosed in the Smith patent in respect to structure, and if there is any material differences in it, make them clear to the Court.

A. Now the differences in the machine—

Q. The commercial machine.

A. Naturally this isn't the same scale drawing as that structure, but the differences are in the—one of the differences named are in the trays, the method of supporting the trays. Now, in that machine that is referred to at Third Street, the twelve upper trays are all supported on chains so that they can be tilted all together, and so that they progress downward. That is, the trays are placed in at the top, and taken out at the bottom. There are no strips. There are no fabric strips between the ends of the trays. They are open. The curtains which are on the machine down there are somewhat shorter than these. They don't come quite down to the hatching trays. The machine has four fans in the corridor instead of two. It was longer—yes, twelve tiers of trays, whereas this one has only five tiers. The principle, however, of circulation, of passing the air down the column and
264 corridor between the curtains—

Q. Let me ask you another question first. How about those flexible connections between the tiers and the trays at the lower end marked in the drawing of the patent with the numeral 28?

A. They are not there. I thought I had stated that.

Q. No, you had not. They are not present in the commercial machine?

A. No, they are not present in the commercial machine.

Q. Does that make a difference where the air circulates with respect to the lower trays?

A. Yes, with respect to the lower trays, air is naturally going to take the path of the least resistance and is not going to the place of most resistance.

Q. And if so, in the commercial machine, the air can go up the tiers or trays, can it?

A. Yes, in the commercial machine with which I am familiar, yes.

Q. Yes, that is what I mean, down here.

A. Yes.

Q. Go ahead.

A. The operation of the circulation of air down there, it comes down in the column between the two curtains shown. It comes down to the bottom and there it goes under the trays and also in that case it goes between the hatching trays and the lower tray of the tilting trays, because the curtains aren't as long as these are, that space isn't covered, so the air turns in and from that place it passes on up. Now, of course, the reason it turns in there, and as shown by our test, is because the curtains are shorter and that would happen all the way up as long as those curtains are shortened up and always turns around under those curtains. That is the function of those curtains.

Q. Just state to the Court what tests you made with that Snow specimen of the Smith machine located at the place you have named here in Minneapolis and give the results of the same?

A. The tests made on the Smith incubator or the machine referred to consisted of tests by the smoke method to determine the circulation or flow of air, and also from anemometer tests which I will explain. Now by the smoke method I mean a cloud of smoke was created in the current of air or in the air, wherever we want to test it, by mixing together the fumes of hydrochloric acid and ammonia, ammonia water, and that gives a white fume of ammonia chloride which is easily visible and travels with the air, a smoke fume or smoke cloud you might call it. Now in that machine, the machine was running, that is the fans were operating and the door was, of course, closed. Curtains were down as far as they are on the machine and smoke readings were taken to show the direction of the flow of the air down under the curtains. Now that direction of flow was taken to show whether it was in or out; no attempt to show the degree of in or out. It was in or out, to show whether there was

any other flow. The record of tests here—I don't know whether you care to see these, Your Honor?

The Court: Have you got two?

The Witness: Well, I haven't got two.

Mr. Williamson: We will hand Your Honor one. Here are duplicates. Those are the Smith tests you have there.

A. This is the Smith machine and you have down in the lower right hand corner it is marked, "Test diagram 5, Smith incubator" on the two of these sheets. You have in the upper right hand corner there, is marked the date and time and sheet number 1 was the first test, sheet number 1. Now, on that sheet number 1—

The Court: Yes, I have it.

Mr. Williamson: You can step right up there and explain to the Court.

The Court: I have it.

The Witness: Now, on that are recorded the data that were taken from the tests on the left side of the corridor facing the door. That is I mean from the front of the machine if you stood in the door.

The Court: That is on your left.

The Witness: That is on your left, and these are the test data. The places out on the center lines below are
267 marked "i". I might say in these tests I means air direction in. Now "in" represents flowing into the space under the egg trays, or away from—

The Court: Going from the corridor into the tiers.

The Witness: That is right. Now those points where the i's are marked is right below the curtains, are the points where the smoke tests were taken. They were taken just below the curtain, in the place below the tilting trays, above the hatching trays. Then they were taken in the space below the hatching trays. There you will notice that they are marked "i" and also some figures are given there for the anemometer readings and those particular places at the bottom, we placed an anemometer facing the corridor, and those numbers there are the recorded readings of that anemometer in feet per minute as recorded by the anemometer. The door, of course, is to the left of this. Under the fans are some—for instance, under the fans there are some numbers there at the left, 805 fm, that is 805 feet per minute

The second fan is 1032 and so on, as the feet per minute of the air velocities recorded by the anemometers in a space about one foot under the center of the fan. We didn't attempt to traverse the area at all. We just put in anemometers in one place and took the speed at that place. The figures under the third and fourth fan to the right, under the third one, 1662, and the fourth one, 1725, represent the speed of those fans, by a speed counter, revolutions per
268 minute. That was taken—those were taken with a speed counter and stop watch.

Q. Better state what those are so it will go on the record.

A. The third fan from the front shows revolutions per minute of 1662. The fourth fan shows 1725 revolutions per minute. Now on this—

Q. How about the other two?

A. We only took the third and fourth because there were screens over those, they were not loosened and we didn't want to pull them off, so we didn't take those two. Now at the center top, the word "center opening 10 inches" means that the diameter of the opening at the top of the machine for the inlet of air was ten inches and the velocity, V, is the velocity of 412 feet per minute as recorded by the anemometer of the air entering that opening. Now, in the right at the top there is marked "L. S.", that is left side, opening 6-¼ inches square, 298 feet per minute. Feet per minute isn't on here, but that represents the feet per minute as the air passing out of that opening. That is on the left side of the machine. Now below that, right side, 6-¼ inches square, is the opening and there are 278 feet per minute is the anemometer reading of the air passing out of that opening. In the same way on the left side of this drawing or at the front of the machine we have "left side, 6-¼ inches square, 268 feet per minute." That is the lineal velocity of the air passing out of the opening on the left side. The velocity
269 of the air passing out on the right side was 274 feet per minute. The anemometer, word "anemometer K. and E, 5E, 107," simply designates the number on the anemometer, identifies it. It is a Keuffel and Esser instrument. That is simply the name.

Now, referring to sheet number 2, that is the other sheet, Your Honor. That sheet was taken—that represents the data as taken on the opposite side of the corridor. The only data on this sheet, of course the fan speed was the same as on the other, are the letters showing the direction of flow, were taken by the smoke, and the figures in the bottom line showing the speed in feet per minute, as recorded by the

anemometer. Now, those all show the air flowing in under the curtain. That means away from the observer, from the corridor towards the trays. These original sheets I have here are the sheets of data exactly as I took them at the tests, when all were present, that is both counsel, Mr. Taggart and Mr. Show and the sheets bear my signature made at the time.

Q. The sheets, how many are there of them, the sheets that you have just referred to of the Smith machine?
A. Two.

Mr. Williamson: The two sheets identified by the witness and which have at their lower right hand corner, "Test diagram number 5, sheet number 1, and number 2" are offered in evidence on behalf of the defendant, to be marked as Defendant's Exhibit J-1 and J-2, and with the
270 words "Test Diagram of the Smith Machine."

The Court: Received.

(Defendant's Exhibits J-1 and J-2 are marked for identification by the reporter.)

Mr. Williamson: You have a set, Your Honor?

The Court: I have a set of the others. Are these some new ones?

Mr. Williamson: These are the ones he has just been testifying about.

The Court: I have a set of those.

Q. Go ahead, Professor, whenever you are ready.
A. Well, I finished my last question. I finished those tests and described those.
Q. You have finished, have you?
A. You see I was talking about the Smith, unless the operation, if you want that.
Q. I show you here a set of photographs, three in number which are in evidence and which were identified by Mr. Snow, and are in evidence marked Defendant's Exhibits G-1, G-2 and G-3. State whether you recognize them.
A. I do.
Q. State whether you compared them with the Smith machine which you tested down on the first floor of the Flour Exchange.
A. Well, this is the first time I have seen these photographs. I wasn't there when they were taken, but they are

exactly the same as that machine. They are the same machine.

271 Q. They are the same machine?

A. They represent the same machine, yes.

Q. I believe you said you had not yet described the operation of that machine which you there tested. Did you say that or have you described it?

A. I don't think I gave the description of the operation.

Q. Give a very brief description of it.

A. The operation, as far as the air circulation which we tested, is as follows: The air comes in through the four fans at the top of the corridor, passes down in a column to the floor, or to the space underneath the curtains; from there it passes laterally under the trays and about the lower trays and then goes up to the fan again. Now the exact current or the exact velocity behind those curtains I did not test. I know that it returns to the fan, but I do not know what the velocity is at different stages through there, of course.

Q. Would it be possible to test that reliably without removing the curtains?

A. No, not by any anemometer we have, unless it was by special means. It would have to be a special device. The ordinary anemometer we use couldn't be used there without removing the curtains.

Q. Why not?

A. No way of getting in to read it or to tell what is going on.

Q. State whether the operation of this Snow specimen

272 of the Smith machine, commercial machine now in the Flour Exchange, was materially different from the operation of the Smith machine disclosed in the patent as you have described it.

A. Now confining it to the operation, the machine, as tested, had curtains that were a little bit shorter than those shown in the specifications of the patent. Therefore the air turning around under those curtains actually passed across between the lower tilting trays and the hatching trays. Now there are structural differences, like the trays and so on, but substantially the circulation is the same as in the patent, with the exception of those curtains being a little shorter.

Q. And how about the cut offs at the bottom in the patent?

A. The cutoffs were omitted too. There was no cutoff. no canvas or flexible connections between the tiers of trays. They were open.

Q. So the air could circulate up between them?

A. The air could circulate directly up through the trays.

Mr. Williamson: I will just do this, if that Smith machine, that Snow specimen of the Smith machine now in the Flour Exchange has not already been offered in evidence and marked in evidence, I offer it now.

The Court: It will be received.

Mr. Williamson: It will be marked Exhibit K. But I think it is already in. On the understanding that Mr. Snow is to have the right to use it this hatching season, commercial season.

273 Mr. Ely: Well, that is the Smith machine.

Mr. Williamson: All right. It is in now.

Q. Did you inspect and test the Snow incubator located at the same place that you have said this Snow specimen of Smith incubator was located? A. I did.

Q. Did you ever see any scale drawings of that Snow incubator? A. I have.

Q. I show you a set of drawings here and ask you to state whether you recognize them or not, which purport to be made to a scale and consists of five sheets of drawings.

A. I recognize them.

Q. Have you compared those drawings with the actual machine? A. I have.

Q. Do they correctly represent that machine?

A. They do.

Mr. Williamson: The drawings identified by the witness, being five sheets, are offered in evidence on behalf of the defendant, to be marked Defendant's Exhibits L-1, L-2, L-3, L-4 and L-5.

The Court: Received.

Q. Now, Professor, give a brief description of that Snow incubator with reference to these drawings, and make it as brief as you can, consistent with clearness and if the description of the drawings themselves is sufficient to
274 indicate the parts, don't go to the trouble to specify any details but try to make it so clear to the Court that he can understand what is shown on those.

(Defendant's Exhibits L-1 to L-5 inclusive marked for identification by the reporter.)

Mr. Williamson: Where is his drawing board? Give him his drawing board.

The Witness: I don't need it. When describing these drawings, wherever it is clear I will refrain from putting in letters or anything on the drawings. If there is a question of doubt, I will letter them or number the points.

Now referring to Figure 1, that represents to scale a front elevation of the Snow incubator as installed and tested at the Flour Exchange Annex. There is a central door, and on either side there is a motor which will be shown by the later display. The fans on each side of the machine. In the upper right hand side there is a motor switch, marked "motor switch", which is a switch for operating the two motors shown at the or below that there is a thermostat case, which is shown covered up here, and which contains a contact switch which is operated by the thermostat in the incubator. The heater contactor box is the mechanism by which the current is thrown on and off, the heaters from the thermostat. Now below that heater contact box is a master switch or switch coming in from the outside. And up in the or just in the upper right hand corner of the door is a light switch or switch which controls the lights within the
275 incubator. Now the motors will show better in another view, but just above the motors we see the outline of the wheels or pulleys which operate the agitators inside, and just above the motors and pulleys there is an extension on each side which is the air inlet for the incubator, and that will be shown a little more in detail later.

Now referring to Figure 2, this is a right side elevation of the machine. By right side I mean when you are facing the machine from the door. The equipment described for controls is shown at the left in outline. At the central part the motor is shown and also the two pulleys which operate the agitators inside of the casing or housing and the belts which connect these pulleys with the motor. Now above each pulley there is a view of the air inlet box of housing, you might say, and invisibly back of that are shown by dotted lines the outlet openings through the wall of the incubator. That shows where the air gets in. It comes in at the end of those boxes, box-like arrangements, and passes into those holes. And on each end of each box there is an extension there which is a door or a movable cover which regulates the air that goes in. In other words, the air going in can be regulated to any amount as desired. The lines and so on across the front and down to the motor merely represents the electrical connections leading to the motor and to the lights in the back and the heating coils.

Now referring to figure 3, that is a vertical cross-
276 section of the machine through the corridor looking to the left. On the left side of this view the trays have been removed in order to show the tray supports, the openings for the inlet air and the agitator. The agitator or those paddle wheels I will designate by the number 11. I am taking starting with 11 because there are some other numbers here and I don't want to confuse it. On the right half of this view the trays and the tiers are shown in place with the tilting trays tilted to the left downward, and the hatching trays placed underneath. At the upper part of this section, above the tilting trays are some bar like arrangements there which are the heating elements. I will mark those 12. I don't know whether it is clear.

The Court: Yes, I see it.

The Witness: The heating elements and at each end of course an electric light, and at the left end electric light switch. At the top there are two openings shown which I will call 13, for designation, 13 and 13-A. Those openings are for the outlet of air from the machine. And below those openings there is a sliding damper or closure which I will call 14 and 14-A—that is this right in here, Your Honor—for the purpose of closing those off and regulating the amount of air which leaves the machine through these openings. The vertical supports for the trays are shown at the left part. I will mark those vertical supports 15. Those are the vertical
277 supports at the back of the trays for hanging the center of the tray. The chains which support the sides of the trays in front are shown at the right hand and I will designate those as 16. I might explain that the top of those chains are hooked onto a bar which allows them to tilt back and forth. It doesn't happen to be shown there, a bar across there and hanging which tilts. The door is at the left of this view at the left side. The space, of course, under the hatching trays, is apparent there. There are two hatching trays with a space underneath.

Now referring to Figure 4, Figure 4 is a vertical sectional view through the line of the rear agitators. It is marked on Figure 2 where the view is taken, but it is a view looking back, looking from the front towards the rear with the front half of the machine cut away clear back to those rear motor—pulleys and the agitating blades on the side of the case. Now, this view shows—

Q. Now this view, you mean some figure?

A. No, I meant the whole.

The Court: That is Figure 4?

The Witness: No, I meant Figure 4.

Q. All right.

A. Pardon me. I will say this drawing shows, both at the left and right, the rear pulleys for the agitators, shows the shaft coming through the housing in each case and shows the agitating blades which are placed outside of the trays near the housing. That is another view of the blades
278 of the agitators.

Q. What set is that now?

A. Now, wait a minute, I am talking still about the Figure 4.

Q. All right.

A. Those agitators are the same agitators, or it is another view of the rear agitator which is shown by 11 in Figure 3. That agitator is there cut away half so it isn't actually on this view, and I would letter those agitators 11, just the same as the other view, in order to indicate what we mean by them. Just above the pulleys on each side, there is an outline showing the inlet air box and there are some openings through underneath that which show the openings from the inlet airbox into the inner chamber. Now I will number that inlet air box 17, and the opening shown there as 18 in order to designate the air inlet. That is 17 and 18. At the top of the machine is an opening which is one of the air outlets, and I will designate that as 18, so if there is any further reference to it. The trays are shown in section, the trays are shown as cut down through the center of the trays, through the tiers there, and it shows the trays, the length of them and proportions and it shows the center aisle or corridor and on the rear of the center corridor are shown the numbers which are used in setting the different trays. Now in the top near the center are the heating elements, which we call 12. There are two of those, one on each side. These are the elements I refer to here, one on each side. And
279 below those heating elements are pans for water, humidity pans where water is put into the incubator. I will call those humidity pans 19. In the central part down at the base is a humidifier which is an atomizing humidifier for the purpose of supplying humidity to the machine. Now I believe the other supports and so on are apparent there. I will call that humidifier 20, in case it is necessary to refer to it.

Now, referring to drawing 5—

Q. Sheet or figure?

A. Figure 5, yes. Call it Figure 5, that is the way it is lettered here, Figure 5. This shows some of the details of the parts of the machine. For instance—well, I will have to change my first statement. I thought 5 referred to the whole sheet. It only refers to every one. Figure 5—

The Court: I see. Each one is numbered here. Figure 5. Various drawings.

The Witness: Yes, and figure 5 doesn't refer to the whole sheet as I thought it did. It refers to only the one. Figure 5 then is a section, lengthwise section, through the tray, one of the egg trays. Figure 6, an end view of one of the trays and shows the hangings and the chains. Figure 7 shows the rear support for the chains upon which the trays are hung, and shows how it may be tilted either way. Figure 8 shows a portion of the section just above the hatching trays, shows that screen in there. Figure 9 shows a guard
280 placed on the end of the egg trays while they are in the hatching trays in order to keep the chickens in. I think that is all.

Q. Now, Professor, you have testified you made a series of tests of that Snow incubator, have you not? A. Yes, sir.

Q. Did you receive from me any general instructions in respect to the conduct of these tests of that Snow incubator and applying also to the proposed tests of the Smith machine and any tests that you might make of any other machines in question.

A. The only instructions that I got from you was to make the tests in my own way and then be absolutely fair and show what the machine was doing.

Q. And have you done that? A. I have.

Q. And if there is any doubt who was to have the benefit of it, according to my instructions? A. The other side.

Mr. Ely: Well, I object to that.

Mr. Williamson: Well, he was instructed that way.

Q. What was the answer? A. The other side.

Q. What is the answer?

A. I say the other side—I don't know how to answer that.

Q. The plaintiff was to have the benefit of the doubt.
281 Now, first give a general description of what you understand the operation of the Snow incubator to be

and then subsequently verify that by reference to your tests. But I don't want to confuse the Court by having you first go into the details of the test. I would like to have you give him a general description of what you understand the operation of the Snow incubator to be, based on your study of it, and the tests which you made of it, and then I will ask you to follow with your details.

A. Well, in describing the operation of the Snow incubator I will separate it into parts. I will first describe the circulation of the air through the incubator.

Now in the Snow incubator—I have described the general structure of it—there are four motor driven agitators. That is, they are driven through a belt, one on each side—or two on each side of the incubator. And those are for the purpose of mixing up the air, agitating it, and stirring it up in the incubator. Now those agitators are wheels, paddle wheels, which at first sight you might think were designed exactly like a propeller fan. Now they are so placed and so rotated that if they were used as a fan in the true sense of a fan, they would throw the air outward from the face of it into the center of the corridor. In other words the pitch of those blades is so set and the blades are so rotated that the tendency, as far as the pitch is concerned, is to throw the air horizontally outward into the corridor.

282 Now as a matter of fact there can't be enough air supplied from the back of those blades and there is a centrifugal force throwing the air off from the ends of those blades and that centrifugal force is stronger than it is to pull it—than the force which propels it forward. Therefore the air is actually thrown in every direction off from the tips of those blades in a centrifugal—that is in a plane of rotation, and slightly forward at the ends of the blades. Now of course there is all kinds of action going on underneath that we can't explain in detail, back of those blades. The air which is thrown off at the end of the blades, in these various directions is not at the blade, is partly forward, because there is a double pressure that is a component force, one tangential and the other out into the incubator, you might say. Now of course the air must come from some place, and it comes into the center of those fans against the pitch of the blade. Now, I say into the center of the fans. They are not in a true sense fans. They are agitators, because they aren't working like a fan. If they were fans they would throw the air outward and they would be designed differently. If you had any intention of using them as a fan you wouldnt' expect to run

them backwards. They pull the air in through the center, through the eye of it. The air is thrown out then at the top, bottom, in every direction from the fan, from where it circulates, partly around the outside housing, and partly out through the trays, back around there, there are eddies,
283 currents all through those trays. That is we have in the incubator—I have described one of these agitators, there are four of them operating. Now those four agitators acting together throw the air out from each one of them and those streams of air come together. They mix and diffuse and go all places and directions. If you tried to get the direction back in there, one of those fans, you would find the air is going in every direction. I won't say every, but it is all mixed up. It is a difficult thing to define just where the air current is there, if there is any. Now of course you can take agitation or a mixing of that kind and you can find some place in an orderly operating machine where certain currents will go in one general direction, but the general effect of all of those operating together is a turbulence in there, a mixing and agitation of the full air in that incubator. It is just the same as if this large room, only on a different scale, had large paddle wheels on the side which would mix this air all around in here. We wouldn't expect to find anything except a general mixture. And that is how the paddles in here are mixing the air and distributing it throughout the incubator in different directions, some of it passes into the trays, some of it passes out through the trays. Some of it passes over the trays. Some of it even is stationary. That is, there is much of that air that never even circulates and never even comes to the corridor and down to a mixture in there that is go-
284 ing in practically every direction and you will find many cases in there where it reverses and goes back and forth. It is simply a mixing and agitation of the air in the incubator, and that is the circulation system.

Now in addition to that there are provisions in here which I have shown on this drawing 4, marked 17, for the inlet of a certain amount of new air and there is also provision for a certain amount of—I said of a certain amount of air through 18. That is with this continual mixing and agitation there is a little amount of new air added and a little taken out at the same time. There is a mixing or diffusion process in which new air is added to the turbulence and part of it is taken out. Sometimes this outlet is described as the foul air outlet. Of course it is the air in the incubator. It isn't specifically foul air. Any air anywhere there goes out in your outlet opening.

The Court: The view is that it is freshening the air.

The Witness: That is it, continually freshening like any ventilating system.

285 I don't know of any better way to describe it than an agitation, a churning, and a mixing up of the air by these paddle wheels or agitators. It certainly throws the air in every direction. The agitation or the mixing is caused by the wheels—it is caused by these currents which are diffused in every direction.

By the Court:

Q. You say it is caused by these paddles. I suppose it is also caused by the fact that there is a vent box on the sides,—the sides form the current?

A. Well, I suppose it is technically caused by the paddle, and confined by the box, but it has got to go some place when it leaves. Now, that is the operation as far as the air is concerned, that is, as far as the circulation is concerned.

Now, as to the humidity in this case, the humidity is supplied by the water pans which are placed below the heating element, as shown, and also by an atomizing humidifier, which diffuses the humidity in the air, and back through the corridors. The heat is supplied through the heating elements of this machine, which are electrically heated elements, thermostatically controlled, and the thermostat in this particular case is near the front right of the machine, just inside of the housing. I believe that describes its operation.

Now, to go further with the operation of it, the method of the setting of the eggs has been described here, but the trays in this machine are not moved from the top downward. The eggs are set, as they have been explained, in these vari-
286 ous positions, sandwiched in, as it were; for instance, two trays might be set near the top, or in any position, as far as is designated here by these letters (indicating); two trays at one, and, as I understand it, three then, and, later, two more trays are set at the point two.

Mr. Ely: I object to the witness stating what the testimony was.

The Witness: Well, I just want to bring out the fact that there is an essential difference here that I want to bring out, and that is, that in this machine no attempt is made to bring the eggs in the same stage of incubation at the same place. In other words, it is very evident that the trays are set at different places, and are left there for an eighteen day period in that position, and are not moved down until the hatching

stage. Now, that is a very vital difference in the operation of these two machines. That has not been brought out here.

Mr. Ely: I object to that last portion of the witness' testimony, as I don't think he has ever seen one of these incubators in actual operation.

Q. (By Mr. Williamson) You heard the testimony of Mr. Snow, didn't you?

A. Yes, I did. I will support that by data and theory.

By Mr. Ely:

Q. Well, you cannot support it by experience, you never saw one of these incubators working, did you?

A. What?

287 Q. You never saw one of these incubators hatching eggs, did you?

A. Well, if the data which has been put in here is correct, I know what it is.

Mr. Ely: I object to theoretical testimony, if Your Honor please.

Mr. Williamson: I think the witness ought to be permitted to state it.

The Court: Oh, well, I will let him continue now.

Mr. Williamson: Yes, that is the way he understands it is set up. Go ahead.

The Witness: Well, the point that I wanted to bring out in that regard,—

By the Court:

Q. (interrupting) Well, what you want to bring out there is that it mixes the air up, so that the air is uniform all the way through there, isn't that it?

A. Well, that is part of it, Your Honor, but there is another point that I want to come to later, and that is,—I want to show what difference there is when these are put in in this way, or when they are all together,—there is a big difference in the method of conducting the heat from these eggs.

Q. Well, as a matter of fact, the testimony is that, to get the heat away from the eggs, tends to make it uniform?

A. Well, not in that same manner.

Q. Not in the same manner, but it has the same effect?

288 A. No, not the same effect. I would like to state that a little later; I can show why that is.

The Court: All right.

By Mr. Williamson:

Q. Go ahead.

A. I will merely drop that now, and this question, I believe, was as to the operation. I think I have covered the essential features of the operation, though. Of course, the air is regulated, as indicated by things of that kind; I believe I have covered that question.

Q. Well, you were to go on into the detail, or state the nature of the test you made, and the way in which you tested them, and the results; explain that to the Court.

A. Oh, I did not know that that was in the question. The machine itself, as I have described it here, and given the operation of, was tested on November 14, 1932, in the presence of counsel for both sides, in the presence of Mr. Taggart, and Mr. Snow, and, I believe, in part of the tests there was a representative of Paul, Paul & Moore there; I don't think he was there all the time.

Now, in making those tests, the machine was operated without the heat; that is, the test was for the purpose of determining the circulation of air in the machine, and it was operated without heat because, at 100 degrees, and with the humidity, it would be almost impossible to conduct the lengthy test that we conducted; it would be impractical; it would not
289 have shown anything in addition to that.

The flow of the air,—the direction of the flow of the air through various parts of the machine, was determined by smoke tests. Now, these smoke tests I have described previously. But the flow at a few points, where there was more or less of a definite direction, was determined by the anemometer.

Now, in making these tests, I prepared, ahead of time, data sheets which showed the section of the planes where all data was to be taken, and I furnished these sheets to Mr. Taggart, and to Mr. Ely; they were present at the test; they had a data board and sheet, and recorded all of the data which I have recorded here, or, at least, that was the effort; it was all taken in their presence, and every opportunity was made to give them the full benefit of these tests.

After the tests were over, they were asked if there was anything further that they wanted, and they had been given every opportunity to make any tests that they saw fit to make; everything has been available.

Now, in explaining these tests, I will first refer to the test diagram. I have called these tests diagrams, in order to differentiate them from the detail drawings.

Q. (By Mr. Williamson) The scale drawings.
A. Or the scale drawings, which have been generally called figured. Now, the test diagram number 1 is a vertical section through the machine.

The Court: I don't believe I have that one.

290 Mr. Williamson: Down at the bottom there, Your Honor, (indicating).

The Court: Oh, at the bottom; all right.

A. (continuing) Now, test diagram number 1 is a vertical cross section for the purpose of showing where the larger tests were taken, for the purpose of convenience. For instance, on diagram number 1 you will notice, Your Honor, that there are some lines here "aa". Now, that would represent that the test data was taken on that line; and the test diagram letter,—I will refer to that later, but those lines in there are for convenience in locating the point.

Now, if we refer to diagram number 2, in the upper right hand corner, it says, "Sheet Number 1;" that "Number 1" is in pencil because there are several diagrams. In the upper right hand corner, there is "Sheet Number 1, Diagram 2." That represents test data taken along the line which is marked "aa," or, in other words, [the] represents the test data taken in the plane through the front end of the tray, right at the edge of the corridor, right in that plane, at the front,—at the corridor end of the trays, on the left side of the machine, on the side marked "aa," and to the left.

Now, looking at that diagram, we would be standing in the corridor, looking to the left side, and the door of the machine would be on our left, that is, the opening that represents the door there (indicating).

In taking this data, we used, or I used the smoke test,
291 that is, at the various points indicated where the letters are here (indicating). We puffed some smoke, and observed the direction of the flow of that smoke. Now, in order to record it here in a plane line this, that somewhere nearly represents as close as we could get the action of the air;—we had to designate certain letters for the direction. Therefore, I used "out," representing away from the tray; toward the center of the corridor, that would be "o;" in, or "i", represents in, toward the fan, or toward the side.

By the Court:
Q. Away from the corridor?

A. Away from the corridor towards the agitating plane, "d" would be down. If the current is down, it would be marked "d". If it were up, it would be marked "u;" if it were forward, it would be marked "f," and if it were to the rear, it would be marked "r." That is, I tried to designate as close as to the making of these directions, as possible, and it will be handy here for the making of these air combination letters, for instance, it may be "iof;" that is in, out and in front. Now, that means that that was a reverse direction there; it passed in for a while, and out for a while, and then passed forward.

In another case, it might be "i f." That would indicate that it passed in and front in that general direction.

In another case, it might be mixed. Now, there are some cases that I could not see anything but the mixed; it would be all over.

292 Now, in "iu," it would be in and up, and so on, through these various points, this record indicates as closely as possible the direction of flow. Now, there was not any intent to give weight, for instance, in saying "iod,"—it was not intended in the record whatever to give weight to those, in the amount of the flow,—putting the heaviest first, or anything like that, because if it went in, out and down, it was very difficult sometimes to tell which was the most predominating. Therefore, "iof" would have the same meaning as "ofi" in this record. There was no attempt to show the predominating letter first. It would have been very, very difficult to have done so in many cases.

There were,—in this particular diagram data was taken on the center lines of the trays, as shown, that is, the center lines of the tiers of trays are numbered from one to twelve. One, in this case, being the front of the machine, and data was taken in these center lines, and on the cross-center lines, which are shown from top to bottom in the machine.

Now, in this cross center line, we start out,—one of them is,—well, one of them is just above the top tray; one of them is just between three and four, and the next one is between six and seven; and the next one is between nine and ten; the next one is below the lower tilting tray, and the last one down is below the hatching tray.

And then, there is an additional line taken just at the top, just below the ceiling, which is not shown [a] by cen-
293 ter line here, although the figure is there.

Now, in addition to these directions, or this data which was taken on the vertical center lines of the trays, data was also taken in many cases between the trays, and wherever they were taken between the tiers of trays, and wherever taken has been recorded here at the point where they were taken, as closely as possible.

Now, I would like to call attention to some of these figures, although I don't think it is necessary to go through them all. If we were to take a line some pl[illegible] through in here (indicating), and over here (indicating) [illegible] supposing we take the second center line down, we pass [illegible] the top down, as between the three and four tray.

Now, as we pass from left to rig[illegible]m tray to tier one to twelve, we find it going along there, out near the casing; on the center line of tier one it goes out; on the line between tiers one and two, it is out, down and to the right; on the center line of tier two, it is out and right; that means out into the corridor, and to the right,—pardon me, it is the rear; the letter "r" is rear; in this case it happens to be right, too, but "rear" means the rear of the machine. Between the tiers two and three, it is in, out and down, "iod;" that means it is coming both ways. On tier three, it was in; between tiers three and four, it was in, out and front. On tier four, the center line of tier four, it was in and front. Between tiers
294 four and five, it was in, out and front. On tier five, it was in, out and front. On tier six, it was "iof," in, out and front. Between tiers six and seven, it was in and out. On tier seven, it was in and out. Between tiers seven and eight, it was in, out and down. On tier eight, it was in and front. Between tiers eight and nine, it was in and front. On tier nine it was in and front. On tiers nine and ten, it was in and front. On tier ten, it was in and front,—that means forward. On tiers ten and eleven, it was in and front. On tier eleven it was in and front. Between tiers eleven and twelve, it was in and up. At tier twelve, it was in.

The Court: Number twelve is doubtful?

The Witness: Mine is marked, in my table; it must have been a mistake in recording.

The Court: This is twelve (indicating)?

The Witness: Right there. Well, we might go through all of those.

The Court: Well, it is not necessary.

Mr. Williamson: I shall suggest that the witness go from the bottom to the top and read those lines.

The Court: Those letters are plain and mean what they say, and he has described them; there is no need of running through them.

Mr. Williamson: If you think so, Your Honor, that is all right, but maybe he ought to take one or two more, so as to get them in the record. It is pretty difficult for a
295 stranger to take these things up and understand them.

The Court: Yes, that is very true, but you have these figures in here, and I understand them.

Mr. Williamson: All right, but I thought it might be well to state the figures between the bottom and some of the other places,—that he might specify the connection of the bottom to the top.

The Court: If any one wants to get an idea of it, he will get a better idea of it from this than from anything else.

Mr. Williamson: All right.

The Witness: There is another additional thing that I should state on this, and that is, in the lower line, next to the floor, there are some figures there, 490, starting at the left 490, 428 and so on. Now, those figures represent anemometer readings, taken at these points, which represent the flow in feet per minute, as read by the anemometer, placed in there in the plane of flow, and the lines which have above them the "o," "o," "i," and so on.

By Mr. Williamson:

Q. Which show whether they were in or out?

A. Which show whether they are in or out, although the reading shows the amount in or out and the flow.

The Court: Now, if you are going to start on another one, you would not be able to finish it. I think we had better stop here.

296 Mr. Williamson: We will adjourn until ten o'clock tomorrow morning?

The Court: Tomorrow is Saturday, and I won't be here tomorrow.

Mr. Williamson: We will adjourn until Monday morning?

Mr. Ely: If Your Honor please, I had hoped that we would get through; I will have to be in Washington on Tuesday.

The Court: I am very sorry; I am due tomorrow in St. Paul, and, what is more, we won't be able to resume here until two o'clock on Monday. I am very sorry that I could not hurry you along any faster, because these matters are technical to me.

Mr. Williamson: That is satisfactory to me, Your Honor. I have tried to expedite this case as much as we could.

Mr. Ely: Will there be any possibility of adjourning this case so that I can take care of that case on the 22nd, and then come back here later?

The Court: I don't think we can; we have been very busy in this term of court; I have not wasted an hour in this term, and I am pressed for time, as well as you are, and you will have to conform to this Court as to the hours.

Mr. Williamson: Adjourned until ten o'clock on Monday?

The Court: No, at two o'clock on Monday; that is
297 because I am required to be in St. Paul in the morning.

Mr. Williamson: Might I just offer,—were you through with your explanation, Professor?

The Witness: I have not finished the tests yet.

Mr. Williamson: All right, never mind.

The Court: We will adjourn at this time until two o'clock on Monday afternoon.

(Hearing adjourned until November 21, 1932, at two o'clock p. m.)

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298 Minneapolis, Minnesota,
November 21, 1932,
2 o'clock P. M.

Pursuant to adjournment the following proceedings were had at the above time and place as follows:

Frank B. Rowley resumes the stand.

Direct Examination.
(Continued).

By Mr. Williamson:

Q. Just before the adjournment Friday evening you had been telling us about your tests of the Snow incubator and

used one of your test sheets. You said you wanted to go on to another. Please proceed in your own way about these tests of that Snow incubator.

A. I think I had finished on the first test diagram, and now I would like to move back into the center line of the corridor and show the circulation of the air by the same method.

Q. Identify your sheets as you go along.

A. The data is here recorded on Test Diagram No. 2, Test Diagram Number 2.

The Court: That is this one.

The Witness: Well, that is a different sheet number.

The Court: All right. I have got it.

A. Test Diagram Number 2, and up on the line in the upper left hand side is marked center line of the corridor looking left. That means, that this test data was taken
299 vertically in the center line of the corridor but the records were made looking towards the left side of the machine in order to designate in and out. Now, points were tested for circulation by the smoke method, the same as described in the first test diagram, the one just explained, and the marks indicating the flow or direction of the air flow are shown on this diagram in as close as possible to the positions where the smoke apparatus was held for the test. Now I don't think it is necessary to go through with all these points, perhaps, but if we take the first center line down from the top as an illustration, between tiers one and two, that is marked "mixed." That means the flow was mixed and it is so indefinite and turbulent we couldn't settle on which direction we should mark it. The next one along that same horizontal line is in the center line of the trays 4. That is marked "mixed up", meaning that it is a mixed direction but the predominant was up, more up than down. Between 6 and 7 on the same line it is marked "mixed down". Means that the air is mixed flow, turbulent, moving in a general down more than up, and so on. On center line 9, it is "mixed down". And between 11 and 12, it is "mixed down". Now, as an illustration, we might move down to the center line which passes between trays numbers 6 and 7 from the top down. The first one between 1 and 2, tiers 1 and 2, "out right". That means away from the observer and to the rear, instead of to the right. If I say right it means rear.

On the center line of tier 4 "mixed up." On the center
300 line between 6 and 7 "out front". On center line 9 "mixed horizontally."

The Court: In other words, these letters show for themselves what they are marked.

The Witness: Those are the readings exactly as I took them, Your Honor, and I just wanted to make it clear.

The Court: I understand all of them here.

The Witness: Then I don't think there is any use—

Mr. Williamson: Whenever you get enough so that the Judge understands you can go on to the next sheet.

The Court: I understand. He started to explain those, the other data.

The Witness: Then I will go on to the next sheet; hurry through these.

The Court: The next one marked "test diagram number 2" is marked the same way, isn't it, by letters?

The Witness: Yes, that is true, "test diagram." The only difference there is marked on line DD and test diagram 1, that means we moved over to the center of the trays. That was taken on the line DD over to the left of that diagram, Your Honor.

Mr. Williamson: Step up and show the Judge.

The Court: Right here.

The Witness: It was on that line right down the center of the tray in the same position as shown on the
301 chart test diagram. And the letters on here indicate the same as on the other test diagrams, the direction of the flow of the air as taken by the smoke.

Q. Read enough so that the record will show a little data that they can refer to the sheet from.

A. Supposing we take the top center line, the line just above the trays. The first reading between the wall and tier number 1 marked "O. D. R." That is out down right—rear. The next reading between 1 and 2 is marked "I. R." which means in and rear, the rear of the machine. Between 2 and 3, tiers 2 and 3, "F" means forward. Between tiers 3 and 4, "in and forward." 4 and 5, "out and forward." Between 5 and 6, "out and forward." Between 6 and 7, "in and up." 7 and 8, "in and forward." 8 and 9, "mixed forward." 9 and 10, "mixed forward," and so on. Now I don't think there is any reason for reading more. They are all apparent on here.

The Court: I understand these diagrams.

Q. All right. Pass on to the next sheet and we will get them in.

The Court: What sheet have you got now?

The Witness: Now it will be test diagram number 3. There are two diagrams 3, and the first one will be line CC.

Q. Distinguish them some way, 3A or 3B or something.
A. This one I will use is test diagram 3.
Q. You mean test diagram, sheet 3.

302 The Court: Test diagram, sheet number 3.

A. The first test diagram 3 is marked sheet number 1 in the upper right hand corner and in the upper left hand corner it says, "Data taken on line CC, diagram number 1." That means it was taken down line CC, on test diagram No. 1. Now this shows the same data, the same general data taken on the other side of the machine along the line CC, which is just at the front of the trays, front end of the trays on the left side—or the right side.
Q. Looking from what, please?
A. Looking from the corridor towards the trays.
Q. And back to the doors, I suppose.

The Witness: That is here, Your Honor.

The Court: Yes, I understand it is right along here.

The Witness: Right along there, that is correct. Now there is one other test diagram number 3.

Q. Distinguish it in some way from the other 3.
A. Which is marked in the upper right hand corner, sheet number 2, and the upper left hand side on the line "data on line DD, test diagram number 1."

The Court: I don't believe I have got that one.

The Witness: Test diagram 3. There is a 2 up in here.

The Court: Here it is.

The Witness: This sheet shows data taken along the vertical center line of the trays as indicated on the test
303 diagram number 1 and is substantially the same as the one on the opposite side of the machine. That is it records the data in the same way and shows whether the flow is in, up, down, right or wherever the air is flowing as close as we could judge.

Now that completes the diagrams on the sectional views interior of the machine, with the exception of test diagram number 4, which shows the horizontal section of the machine. That is a horizontal plane through the machine and on that diagram are shown the speeds of the agitators. There are some notes there. The upper right hand corner is marked sheet number 1. There is only one sheet for this diagram. The speeds of the agitators in each case are given right in the center line of the shaft in the machine at the four points. The agitator on the upper right hand side, 204 R.P.M.; on the upper rear, 184; the lower right—that should be right instead of rear, the lower rear of the machine, 190 R.P.M. and the one on the sheet in the lower part of this diagram, 225 R.P.M. The motors are indicated here as half horsepower Wagner, 1725 revolutions per minute. And in the rear is a note indicating the position of the humidifier, which was in position when the tests were made. That completes the data on these test diagrams.

Q. Are you through with them? How many sheets are there?

A. There are six. No, wait a minute. Pardon me. There are seven.

304 Mr. Williamson: The seven sheets identified by the witness are offered in evidence on behalf of the defendant, to be marked Defendant's Exhibits M-1, M-2, M-3, M-4, M-5, M-6 and M-7, and with the words "Professor Rowley's test data sheets of the Snow Incubator now in Minneapolis and in evidence as Defendant's Exhibit F."

The Court: Received.

(Defendant's Exhibits M-1 to M-7 inclusive marked for identification by the reporter.)

Q. If you have not already done so, please state the speed at which the agitators were running at the time you made the tests of this Snow incubator.

Mr. Ely: He has already given them.

The Witness: I have already given them.

Q. Have you already given them? All right. Now, Professor, you heard Mr. Taggart's testimony, did you not?

A. I did.

Q. And he made reference to a trip to Sleepy Eye, Minnesota, at which he and Mr. Ely were shown, at their request, a specimen of Mr. Snow's steam heated machine. Were you present at that time?

A. I was.

Q. Can you, from memory or by reference to any record that you have got with you, fix the date when that occurred?

A. I can.

Q. Well, do it. What was the date?

305 A. On September 29, 1931.

Q. 1931?

A. 1931.

Q. State just what was done at that place at that time in your own way, making it as brief as possible consistent with clearness.

A. At that time we first inspected the machine and Mr. Ely and Mr. Taggart were given a chance to go over the machine which was at Sleepy Eye. And then we made some smoke tests. That is I conducted those tests, showing the smoke flow in the corridor through the line parallel to the lengthways of the machine, in a plane of the end of the left trays and then in the center plane of the corridor and then in a plane on the left side, parallel with the end of the trays —in the plane of the end of the trays at the left side of the corridor is clearer.

Q. Did you keep records of those tests?

A. Those tests were recorded as in and out flows and mixed. The tests weren't as elaborate as those we have conducted on this machine.

Q. You mean this machine in Minneapolis?

A. On the machine in Minneapolis. They were much shorter, merely to show the in and out flow and some of the predominant up and down flow in the plane at the end of the trays and also in the center of the corridor, center line of the corridor. The revolutions of the fans or agi-

306 tators were also taken at that time, I believe.

Q. Did you tabulate those results? Did you tabulate any of the results of the tests?

A. I tabulated those that I have mentioned.

Q. Have you got the tabulations with you?

A. I have in my case.

Q. Produce them. Have you got them in your hand now? A. I have.

Q. Identify them and describe them, but make it as brief as you can consistent with clearness.

A. I will mark these in order to identify them as—

Q. Sleepy Eye?

A. Sleepy Eye.

Q. Get the Sleepy Eye on them.

A. Sheet Number 1, which is on the plane, taken at the plane of the end of the trays from the corridor looking left,

to the left side, and the machine is designated the same as this one was tested here, that is looking from the door rear.

Q. You mean facing from the door?

A. Yes, facing from the door.

(Defendant's Exhibits N-1, Sleepy Eye Test Sheet Number 1, Defendant's Exhibit N-2, Sleepy Eye Test Sheet Number 2, and Defendant's Exhibit N-3, Sleepy Eye Test Sheet Number 3, were marked for identification by the reporter.)

Q. Proceed in your own way and describe those tests as far as you think it is necessary and make it brief.

307 A. Since the method of recording was the same as in the tests made on the Snow machine in the Flour Exchange—

Q. Minneapolis?

A. Minneapolis, I don't think anything needs to be said.

Q. State whether or not the results were substantially the same or whether they were different.

A. I would like to explain just a trifle.

Q. Well, explain it in your own way. Go ahead.

A. Those figures are used the same, but the tests on the diagrams were at that time made primarily here to show the in and out flow and these lines above top tray and so on, below, we had no drawing at that time. This is below the third and fourth tray and below the sixth.

The Court: I am looking in.

The Witness: Yes, you are looking in the left side from the corridor.

The Court: This is right.

The Witness: Yes, that is rear.

The Court: And this is?

The Witness: This is front, you are looking in the left side of the machine.

Q. If you are going to make any explanation speak so that the reporter can get it down, please.

A. That is looking in from the corridor towards the trays and the record, of course, was made as previously explained.

308 Now sheet number 2 is taken on the same line at the right side of the machine looking from the center of the corridor into the trays at the right. This then becomes the front of the machine and this the rear. The elevations are the same as in the other sheet.

The Court: These are the line of trays.

The Witness: Those are the center lines of the tiers of trays, yes.

The Court: Yes.

The Witness: Test sheet number 3 was taken through the center line of the corridor looking to the left. That is, we were standing on the right side of the machine looking left, and this is through the center and the records were taken showing the action of the smoke at the points as indicated on the center lines of the trays and the vertical lines as shown.

Q. Do the speeds of the agitators appear on your diagram sheets?
A. I don't see them. I don't believe they are here.

The Court: You had the speeds on another sheet?

The Witness: Yes, I think they are in my notebook. I will have to look it up.

Mr. Williamson: Refer to your notebook while I offer those in evidence.

Q. Are they three sheets?
A. Three sheets.

Mr. Williamson: The three data sheets identified by the witness are offered in evidence on behalf of the defendant, marked Defendant's Exhibit N-1, N-2 and N-3, and
309 with the words "Professor Rowley's test data sheets of the Snow Sleepy Eye steam heated machine." I have got to keep these things distinct in the record and for the argument.

The Court: Received.

Q. Refer to your notes and state at what speeds the agitators were run at the time these tests were taken.
A. I have here in my notes September 29th, speed of the agitators 210, and 208.
Q. One—
A. One note here 210, that one agitator.
Q. There are four agitators in the machine, are there not?
A. I don't find the other two, but they are substantially the same thing. I don't find them in my notes.

The Court: That is the way they were running when you took those tests?

The Witness: That is the way they were running when I took those tests.

Q. All four of them, as far as you could judge?

A. Yes, this represents the speed.

Q. State briefly, in a general way, whether the results of the tests that you made at Sleepy Eye show any different results, in substance, as compared with your tests of the Snow machine here in Minneapolis as far as they go.

A. No, in substance the tests show the same action. Of course any different machine will have perhaps air motion at a different—at a certain point a little different
310 under different conditions. That would be due to the machine, perhaps, and to the agitator speed and so on, but in substance they are the same.

Q. So far as the air circulation is concerned?

A. As far as the general air circulation of the machine.

Q. As far as the general air circulation is concerned. State how that machine compared in size with the Snow machine here in Minneapolis.

A. Well, I didn't measure the machine, but I think it is just a little bit higher than the Snow machine, a little more head room.

Q. How about the length and width?

A. The length and width were substantially the same, the same trays in it.

Q. How about its general structure, with the exception that that one was steam heated whereas the one in Minneapolis was electrically heated?

A. Well, the general structure is the same.

Q. Trays and everything hanging the same?

A. Yes.

A. State whether or not after you got through making the tests which you did make of that Sleepy Eye machine at that place, Mr. Ely and Mr. Taggart were invited by me and permitted to make tests themselves of that machine at that time? A. They were.

Q. And did they make tests?

311 A. They did.

Q. And did they tear the machine apart more or less and take out trays and tiers of trays and all that, in our presence?

A. Yes, they first tried to take anemometer tests on the rear by spreading the trays, separating them, and after trying that they finally removed the trays and they took anemometers in the back with a great number of tray space removed, showing the circulation by anemometers at a diagonal direction.

Q. State whether or not in those tests at Sleepy Eye, streamers, strips of paper or cloth, light cloth, were applied at various points in the machine by Mr. Taggart in making his tests?

A. Yes.

Q. The tests which he conducted. State whether the action of those streamers showed anything different than your smoke test. State whether the movement of those streamers helped to show the circulation in that machine and whether or not the circulation so shown was anything different than shown by your smoke tests?

A. Of course the streamers were placed in a different position than my smoke tests were taken. Those streamers were placed back along the wall and diagonally across and a streamer fluttering in the air will show a general movement in one direction, but it can't show a downward movement, of course, because the streamers can't leave the ceiling.

312 Q. In the tests of the Snow machine you made here in Minneapolis in the presence of counsel and Mr. Taggart, a great many streamers were in the machine, were they not? A. Yes.

Q. State whether or not the action of those streamers showed the movement of the air to be substantially as shown by your smoke test?

A. You refer to these tests here?

Q. In the Snow incubator here.

A. Yes, practically the same with this exception, that a horizontal streamer shows only one direction. It shows not up or down.

Q. Did you make any anemometer tests in that Sleepy Eye machine at Sleepy Eye at the time you referred to?

A. Not that I recollect, no.

Q. But did Mr. Taggart make anemometer tests?

A. Yes.

Q. Now, Professor Rowley, you have described the methods in which the air is circulated in the machine of the Smith patent here in suit, and in the commercial specimen of the Smith machine that you have seen and tested and you have described the method of air circulation in the two Snow machines, the electrically heated one here in Minneapolis and the steam heated one at Sleepy Eye. Please compare, in a general way and as brief as you can, and point out the identities and differences of the two sets of machines, I mean of the Smith machine as compared to

313 the Snow machine or the Snow machine as compared with the Smith machine. I want you to just make a

summarized statement, as brief as you can, of the features of identity and the features of difference present in the air circulations of those respective machines.

A. You want me to confine that to the air circulations and not to the method—

Q. I am confining it now. I am going to ask you another question later. I am confining it now to the air circulation, but make it as brief as you can.

A. In the Smith machine there is a little difference of course—difference there as to the machine or structure shown in the patent and the actual Smith machine in that those canvas strips of course, were omitted.

Q. You mean in the commercial machine?

A. I mean in the commercial machine, in that those canvas strips were omitted. Now, in the Smith machine there are trays on each side of the corridor, with a central corridor. There are curtains on each side of the corridor at the end of the trays. There is a fan placed at the top of the corridor in what you might call the false ceiling for the purpose of blowing or forcing the air in a column down through the corridor underneath the curtains and up through the—circulating it up through the trays on either side of the machine, from where it goes back, the majority of it goes back to the fan for re-circulation. Now, that is briefly the circulation of it. There is a confined channel or a col-
314 umn of air which moves downward to the bottom of the trays and then filters up through or between the trays, up to the top where it is brought back to the fan again, and circulated. Now, in that particular machine there are two fans shown in the patent specifications and four in the commercial machine, which is merely a matter of number along the corridor. The principle of action is just the same. In the Snow machine the trays are present, the same type of trays. They are all different sizes and so on, but the trays are in the sides. There is a central corridor without any curtains. The trays are set farther from the rear walls in the Snow machine and back of the trays on either side there are two four-bladed agitators or wheels in there which are rotating and stirring up the air on the back walls of the machine, throwing it outward mostly in a centrifugal direction, that is by centrifugal force in a tangential direction from the blades, slightly forward at the tips of course, where it passes out, part of it along the ceiling, confined of course along the ceiling or the side walls or the floors from either side where it either gets in the corridor in some places or in some places it may cross clear through. Some

of those air streams pass clear through the trays at the back and return in a course which is more or less turbulent in the center part of the fan or in the central section of the fan, I might say. Others pass part way through the trays and back, and they pass in general in undefined cur-
315 rents around through the machine. That is in the Snow machine there is no attempt to have a defined current of air. It is an agitation, mixing, stirring up of air, and that air, even in the places where it flows towards the eye of the fan, is not a true stream-line, but it is more or less turbulent, up and down, and so on, although its movement in that section towards the eye of the fan or agitators on the side which carries the air in which is thrown out around the sides. Now, in the action of the air circulation in the Snow machine, there is a question of principle brought out there that is different than the Snow machine—I mean than the Smith machine. The air velocities and agitating blades are at the side of the machine. Now, that has two effects. In the first place if there are any cold places, if there is a cold outside wall in the incubator, if it is in a cold room with a temperature in the incubator at a hundred degrees, the cold spots in that incubator as far as the outside is concerned, are more apt to be along the outside walls. Now, high velocities or circulation of air, high agitation there on those outside walls, stirs that air up and keeps the outside walls outside—I mean the inner surface of the outside walls at a better temperature, at a more uniform temperature than would be the case if the air was merely filtering up past those surfaces. The difference really is in the Smith machine the air is confined and directed in a specific channel for a specific purpose, which is down through the corridor and up
316 through the trays. In the Snow machine there is a general agitation and it isn't directed down through the corridor. It is mixed—

Mr. Ely: Pardon me, just a minute. If you will stop waving your hand.

Mr. Williamson: I am not waving my hand. I am not. Well, I deny it.

The Witness: It is generally agitated and mixed up, and, as I want to explain, it has a different function as far as heating and taking care of that incubator. There is a different principle which does not come out in the air circulation, a different principle in those two machines which hasn't been brought out here.

317 By Mr. Williamson:

Q. Bring that out.

A. I will have to refer to some of the exhibits. I would like to take Exhibit 2, I believe it was. (Exhibit submitted to the witness.)

Mr. Ralph Williamson: I have a list of exhibits here, Mr. Rowley, if you care to refer to those. (Document submitted to the witness.)

Mr. Williamson: I believe that is not in evidence yet.

The Witness: Well, I would like to know the number of it.

Mr. Williamson: I suggest that you wait until the Judge is through writing.

The Court: No, I can hear him all right.

Mr. Williamson: This is our copy, Your Honor.

Mr. Ely: Here is Plaintiff's Exhibit 2 (Document submitted to the Court).

By the Court:

Q. Do I understand you to say that you think that in the Snow machine the distribution of the air by a fan is more liable to eliminate a cold spot?

A. Yes, on the outside wall.

Q. On the outside wall? A. Yes.

Q. Why?

A. That is due to the higher velocity. Now, the principle, as an illustration, is this: We know that we take the
318 cold air from a window, where there is moisture condensed on that window; we know that if we place a fan against that, and blow the air against it, it clears up the window.

Now, the principle there is, that the,—I don't want to get too technical here,—but the surface coefficient of transmission is increased by the action of that air. Therefore, if you increase the surface coefficient of transmission of the glass, that means that the temperature drop necessary to force the heat from the air to the surface of the glass is less; it therefore means that there will be a less difference in temperature between the air and the glass. That is the theoretical reason for it. Now, practically, of course, it brings the air and the glass more nearly to the same temperature.

Now, in the incubator, we have the same problem, to a more or less degree, depending upon the location of the incu-

bator, in a cold room, or in the surrounding air; the incubator temperature runs somewhere around,—that is, the air temperature within it,—runs somewhere around 100 degrees, and I suppose it might be, in a room which, during the incubating season, might run 60 or 70 degrees; I don't know; it depends on the surrounding air. But, at any rate, between the air on the outside of the incubator, and the air on the inside, there is a drop of temperature which may run 20 or more degrees; it may run considerably higher than that.

Now, that drop of temperature is divided up between
319 the air on the outside, and the air on the inside, and if we would follow those through,—that is, if we were to take a thermometer and follow it through from the outside,—from the air on the outside of the incubator to the air on the inside, we would find, as we follow through the wall on the outside, that the temperature would rise slightly toward the inside temperature.

Now, as we get on the outside surface, with the thermometer, or thermo-couple,—I prefer to use a thermo-couple, because it would be impossible to do it with a thermometer,—the temperature on the outside surface of this wall is slightly higher than the outside air temperature.

Now, as we pass through the wall with this thermo-couple, that temperature gradually rises in each stage, until we reach the inside surface of the wall. Now, when we reach the inside surface of the wall, that temperature is still lower than the air temperature in the incubator.

Now, a practical case might be the average wall; for instance, in the wintertime we know that the temperature on the outside wall of our house depends entirely on the construction and the temperature differences, and it may be from five to ten or fifteen degrees below the air temperature.

Now, if we take the window glass temperature, where there is less insulation on the glass, that temperature on the glass may have a material drop. It may have the glass temperature, which, of course, might be the freezing
320 point, because we cannot get frost on that otherwise

Now, the same principle holds in the incubator, and there is a temperature on the outside surface of the incubator which is lower than the air temperature in the incubator; and the amount of that depends on the insulation; it depends

on the air circulation in the incubator, and it depends on the temperature difference between the air inside and outside.

Now, if we take a given condition for the incubator,—let us assume an outside air temperature, we will say of 60 degrees, as an illustration, and an inside temperature of the incubator of 100 degrees. Now, the temperature drop would be greater between the air on the outside and the inside surface of the wall, of you had no agitation there, then it would if you had agitation; or, in other words, with heavy agitation on the outside wall, you can bring those surface temperatures very nearly up to the inside air temperature; without agitation, you cannot do that; you would be getting a drop, because there is a heat resistance, and when you have a heat resistance you must have a temperature drop for the heat flow.

By the Court:

Q. You are taking it for granted that the outside wall will naturally be a little colder than it otherwise would be, because it has the effect of the cold air on the outside, and therefore the inside surface of the wall might produce what you call a cold spot; I suppose that is true?

A. Yes, that is true.

321 Q. The point that I am interested in is why your machine would distribute the heat, to break up these cold spots, more than the Smith machine?

Mr. Ely: I don't think this man has ever been in an incubator.

The Court: Well, I was just asking him.

Mr. Williamson: This man is called by experts on heating and ventilation all over the country.

The Court: Well, we are now accepting him as an expert for this purpose.

By the Court:

Q. As I understand your machine, the way the air is driven, it is driven by these side fans, and, as you say, it mixes the air? A. Yes.

Q. Doesn't the other machine draw the air under the curtains, and mix it in the same way?

Mr. Williamson: No, sir, not by any means.

A. No, sir.

By the Court:

Q. That is, there is a current of air carrying the fanned air within itself, and off, and the intent is to mix it, and it drives it around, doesn't it?

A. There is a current of air, but it is of very much less velocity,—the velocity from the tests that have been submitted here by Mr. Taggart. I have not checked those by anemometers, but if you look at these test sheets, you will notice that the velocity of the air circulating up
322 through the different trays in this machine is very much less than the eddy currents on the outside of that, as shown in the Snow machine.

Q. Then, am I to understand that your contention is that because the air is moving at a less velocity, that therefore it is not liable to break up the cold spots?

A. Yes, the question comes at the point of the surface coefficient. I have a pamphlet here; I might show that to Your Honor.

Q. (interrupting) No, just explain that as far away from your technicalities as possible.

A. When heat flows from the air to the surface, or from either way, there is a drop of temperature that occurs there, because there is a heat resistance. Now, universally, that resistance is called the conductance coefficient, or the surface conductance of the surface; that is the technical term for it.

Now, the surface conductance means the number of British thermal units which will pass between the air and the surface, per hour, per square foot of area, per degree difference in temperature between the air and the surface, or, in other words, the higher the surface conductance is, the more heat will pass for the given difference in temperature.

Q. Well, the air in that incubator is already heated, and if we hold the air right there, or it passes slowly, with the same degree, as if it were passing more rapidly, would
323 the rapid passage of the air have more effect upon the wall than the slow passage of the air?

A. Yes, the rapid passage of the air would reduce the temperature between the surface and the,—

Q. That is your point?

A. That is my point, yes; that is only one point on that matter, but that is the point; that is the very definite point as to the cold outside surface.

Q. (By Mr. Williamson) Go on and explain,—

The Court: (interrupting) Just a minute. That is, there is a wall there, and it is a little colder than the general air on

the inside. If we fan the air against that, and if the air is at a certain degree of heat,—if the air is up to 60 degrees, we will say,—then we fan air along the wall that is 60 degrees, your point is that the air passing along the wall at 60 degrees is more apt to tend to warm that spot, more than if it is just standing still; that is your point, is it?

The Witness: Yes, that is it, that is, assuming that the other side of the wall is colder than the inside.

The Court: Yes, I am assuming that, of course.

The Witness: Yes, it would work that way. In other words, the theory is that it changes the surface coefficient.

By Mr. Williamson:

Q. Well, are you through with your answer? If so, then will you explain how the heat transmission is affected in these incubator machines, the Snow machine and the
324 Smith machine,—how the heat is transmitted.

A. Well, first I would like to make,—

Q. (interrupting) Do it in your own way.

A. First I would like to make a general analysis of the problem of incubation as I understand it. Now, from the data and so on that has been submitted here, I think it is evident,—

Q. (interrupting) Speak a little louder, please.

A. (continuing—the problem of the incubation of an egg is, first,—that is, I am speaking just of the changes which take place in the egg. We have been told, and shown here by these curves, that, as the egg is placed in the incubator, in the first stages of incubation, it absorbs a certain amount of heat, that is, the egg must have heat, and that heat must be absorbed from either the air, or surrounding objects, to have it progress in incubation. It gradually develops heat within itself. This developed heat, that is, in the later stages, must be dissipated from the surface of the egg shell. That is, it is a problem, as far as the heat is concerned, of transmitting the heat into the egg, in order to bring it to a temperature, and also to take away this surface moisture evaporation, which takes place at first; and, second, in the later stages, it is a problem of getting the heat away from the egg, or cooling it.

Now, that is part of the problem; it is a problem there of heat control.

Now, another part of the problem is that of moisture
325 control. There is a certain amount of moisture evaporation from the egg in the first stages of incubation.

If the air remains too dry, we are told that the evaporation would be too great, and, if the air is too wet, or too moist, the evaporation will not be enough. Therefore, the humidity of the air has got to be controlled. That is another part of the problem.

Now, the third part of the problem is that of a reasonable amount of new air supply in order to take care of the oxygen required in this exchange which is going on through the egg, in which oxygen is exchanged or taken in, and carbon dioxide is given out; that is, there must be oxygen; if we were to confine it, there would be no oxygen, and no life. There must be that process going on, and, of course when this oxygen is being carbonized, that is the process that is going on in the egg uniformly,—we are forming carbon dioxide, or combustion is really going on, and we are generating heat within the egg.

Now, with the exception of the fact that those eggs need to be turned for other reasons, those are the three fundamental steps, as I see it, in an incubator; first, temperature control; second, humidity control, and, third, a reasonable amount of new, fresh air, so that the air is supplied. It is the same problem in human life.

Now, to analyze that, what methods do we use, or what methods may be used for this control? I think, as far as the air supply is concerned, we all recognize that that is a matter of taking in some air, and letting out some other air,
326 or, it is a matter of keeping that air pure, and a sufficient amount of new air, by an exchange or intermixing process.

Now, as far as the humidity is concerned, that may be added to the air, or taken away, whichever is necessary, by several processes, either by some steam, which is moisture, or by atomization of moisture, or by evaporation of moisture from pans. There are several ways of taking it away, or supplying it. That does not seem to be at issue here. That question of humidity has not been brought out.

Now, as far as the heat generated is concerned, the heat is dissipated from the surface of the egg shell; that is the only place where it can get out, and when we take these individual cases we note that there is a large amount of heat generated within the egg. Now, that heat must be dissipated from the egg shell, in one of three ways: First, conduction; second, convection, and, third, radiation.

Now, an additional amount may be exchanged by evaporation, and that is taken care of in the humidity control. But

the thing that we are concerned with in this heat problem is the transmission of heat to or from the egg, in order to control the internal heat generated, and the internal temperature.

Now, those three problems, temperature, humidity and air supply, are nothing more than heat ventilating problems. That is one of the heating and ventilating problems that we have in our every day work.

327 Now, I want to show, as closely as I can, what happens, or how this heat is transmitted from the surface of the egg, and the relative importance of each one of these steps.

Now, in regard to the conduction from the surface, that conduction must take place by contact with some surface. If you were to contact the surface of the egg with cold surfaces, you would have the heat conducted directly to those surfaces by contact; that is, it would flow from the egg shell to the contacted surface; that would be conduction.

Now, of course, in an incubator there are not very many points where the surfaces are in contact with colder surfaces; I mean, that the egg shell is in contact with colder surfaces. Therefore, there is not such a large amount of transmission by conduction.

The next problem is the question of the amount which is conducted away from the egg by conduction, or by convection of air currents. Now, convection is merely the widening of the air on the surface of the egg, that is, the widening of the air, or carrying away of the heat by convection currents.

Now, the closest conduction coefficient that we have, the closest material,—I have determined many of these surface coefficients in my research work at the University,—and the closest coefficient that we have is that of the smooth plaster on the wall; that is very nearly the same as an egg, and it agrees with all of these surfaces in that class, so we can accept that as a coefficient for the egg shell.

328 We also have the radiation coefficient for the same material, which I will take up later.

Now, the coefficient of surface conduction by air currents, which I have determined over there at the University,—have been determined for outside surfaces, or exposed surfaces of building materials, and so forth.

For a surface of smooth plaster, the surface conduction coefficient for air, still air,—what I mean by still air is that with no artificial circulation,—just merely what you get by normal

convection. The surface coefficient is approximately two British thermal units per square foot of area. These are all on a square foot basis, per hour, and per degree difference between the surface and the surrounding air.

Now, that surface coefficient of two has been determined for various mean temperatures, and for temperature differences between the surface itself and the surrounding air, where the surrounding air is at the same temperature as the outside, or surrounding objects, or, in other words, that coefficient for two, or of two, for plaster, has been determined as a combination of surface conductance, as a coefficient, which is convection and radiation combined, because that surface is actually radiating heat as well as convecting it. So, from that, we must take the radiation coefficient, which I will show in just a minute; it is practically one per degree. Therefore, the conduction coefficient, which we must use if we are going to analyze this problem, is one, that is, one
329 point, which means that one British thermal unit is transmitted per square foot of the area, per hour, per degree difference in the temperature between the surface that we are talking about, and the surrounding air.

Now, that is the coefficient which has been determined for 100 degrees mean temperature approximately,—that is about as close as we can get,—100 mean temperature; that is about the temperature that we are working with in the incubators. I am coming back to that point later. At any rate, the next point is the heat which is transmitted from the egg by direct radiation.

Now, in all of these discussions that I have heard about these incubators, and that I have read in the patent, I have not seen any of them state anything about the heat which is transmitted to and from the egg by radiation, direct radiation. There has been talk mostly about convection currents. Now, heat transmission from the surface to the surrounding objects, or to the surface, depending upon the temperature differences by direct radiation, has nothing to do whatever with the convection currents.

By the Court:

Q. In other words, it is radiating heat?

A. It is radiating heat, or receiving heat, either way.

Q. From the air?

A. Yes, that is, the surface is both radiating and receiving heat, and, if there are two surfaces together, or in proximity,

330 Q. Or from the air?

A. Yes. That is, the surface is both radiating and receiving heat, and if there are two surfaces together, or in proximity, the hotter surface will radiate heat to the colder surface.

By the Court:

Q. In other words, where the eggs are advancing in incubation, they will be radiating some heat into the air, and that will be carried around?

A. Well, Your Honor, the radiating heat does not affect the air that passes through the air; it has got to strike something; it radiates until it hits a colder spot.

Q. Well, it must hit something?

A. Yes, that is right.

Q. It must hit something that is colder, and then it goes into the air?

A. Yes, if the air contacts there, yes, that is right. The law governing radiation is the well known law of Stefan and Boltzman, and it states that the radiation between two surfaces is proportional of the fourth power of the absolute temperature between those surfaces; that means that it is proportional to the fourth power of the differences of the absolute temperatures of these surfaces, and by absolute temperature I mean that we have to go down minus 460 degrees Fahrenheit, because we are talking about the Fahrenheit scale of temperatures.

Now, for the plaster surface, the coefficient to be used,
331 under that law, is .151, and if we calculate from that the radiation coefficient, we find that each square foot of surface would radiate one British thermal unit, per hour, per degree difference in temperature between the surface and the surface of the surrounding objects, or, in other words, for a per square foot of area, the radiation coefficient is substantially equal to the convection coefficient per degree difference of temperature. Now, we must not confuse these two coefficients, because transmission of heat is going on by both, and the temperature difference for convection is between the surface of the egg and the air, while the temperature difference for radiation is between the surface of the egg and the surrounding objects, and if there is no temperature difference there, there can be no loss of radiation, where there might be convection.

Have I made that clear, Your Honor, what I am talking about?

The Court: Yes, I think so.

The Witness: (continuing) Now, I would like to call attention, for just a minute, to, I believe, it is Plaintiff's Exhibit 2,—I am not sure,—at any rate, it is the curve showing the heat units, which are given off by eggs in various stages of incubation.

Mr. Williamson: Plaintiff's Exhibit 2.

The Witness: Plaintiff's Exhibit 2, I believe.

Mr. Williamson: That was used by Mr. Taggart, as I understand it.

332 The Court: Have you two of those?

The Witness: No. I would like to have you see it as I go along on the exhibit. This is our own copy.

Mr. Williamson: Give that one to the Judge, if you can.

(Document submitted to the Court.)

The Witness: Before I take this up, I would like to amplify just a little this radiation coefficient. I stated that the coefficient was practically one. I find here in my notes that it is 1.06, as I have calculated it, for 100 degree mean temperature. The convection coefficient, then, as I have stated, is one per degree difference in temperature between the surface of the egg and the air. Now, that is for what we call still air, that is, it is air which has no artificial current; it is merely of normal eddy current. Now, if we were driving the air at any velocity over these surfaces, that coefficient is increased. The coefficient, for instance, at fifty feet per minute is 1.15; that is the coefficient at fifty feet per minute. That assumes, then, that, the air would be passing over the surface of the egg at fifty feet per minute. Now, from the test data which has been shown, the air around the egg itself is apparently very much less than that; it is very low, because those eggs are confined close together in the trays, and when the air is circulating up through the trays, the air velocity in there is very slow; and, furthermore, if we give the full surface of that egg, which is in contact with other eggs,—

if we give that full surface the benefit of convection
333 current, all around the egg, then we are very liberal if we allow a coefficient of one as the transmission coefficient, for air to the surface of the egg, and take the full surface of the egg into consideration for convection.

Now, I would like to refer to Plaintiff's Exhibit 2, and I would like to take an egg, which is in the seventeenth day of incubation, as an example, from this chart. The heat units

generated by that egg per day are shown to be two and one-half large calories. That means that there are ten British thermal units generated in that egg in twenty-four hours, which must be dissipated from that egg in order to keep the temperature down. That is one of the heat problems in incubation.

Now, in these incubators that we are speaking of, we can take an average tray of eggs, we will say, of 134 eggs, as an average tray, you understand, and if we take 134 eggs, at ten British thermal units per egg, we have 1340 British thermal units, which must be transmitted from that tray of eggs per day, or, divided by twenty-four, to get it on the hourly basis, we have 55.8 British thermal units, which must be transmitted from that tray of eggs in one hour. Now, that must be transmitted by some of these methods, and the principal ones that we are discussing now are convection currents and radiation between the two. Now, I have taken a few eggs, three, in fact, and I have measured the surfaces, as close as
334 I could, to get the average surface area per egg, and I find in that case that the average egg of those three had a surface area of 7.163 square inches, or, on the average there are twenty eggs required to produce one square foot of surface area. I bring that to a square foot basis, because our coefficients are all on the square foot basis.

Now, if we have 134 eggs in a tray, and we divide that by twenty, then we have 6.7 square feet of total surface area per tray of eggs, and that is the area which must dissipate this heat which is generated during this seventeenth day that we are talking about.

Now, we are assuming that all of that surface is available for convection. Now, the surface that is available for radiation must be the projected area of these eggs upward or downward, in which, when the two eggs are touching each other, that part of the surface is not available for radiation in the strict sense of the word, because it is radiating to other surfaces of the same temperature.

Now, if these eggs are packed in a tray of 10½ by 33½ inches, which seems to be the average tray here, the total exposed projected area at the top is 2.44 square feet.

Now, of course, we have the same area at the bottom, or, we have a projected area of 4.88 square feet from that tray, which is available for radiation, providing that the tray is placed so that it can radiate the heat in an effective manner.

335 Now, if this tray, on the seventeenth day, is placed between trays numbered sixteen and eighteen, and that is the case that we are discussing now, because that is the condition of the Smith incubator,—if this tray is placed between eggs of the sixteenth and eighteenth day, in that case the radiation from those eggs will be practically nullified or eliminated, because there will be above and below eggs of very nearly the same temperature, and in order to radiate that heat effectively, those eggs must be exposed to colder surfaces; so the radiation in that condition is practically eliminated so far as the surrounding eggs are concerned, because they will receive heat from the hotter eggs on the eighteenth day, or the next day, as well as to give it to the other eggs which are slightly different; and, in this condition, all of the heat must be given off, then, by convection currents, without radiation.

With an amount of heat generated of 55.8 British thermal units per hour, with an area of 6.7 square feet for the total eggs, and the surface coefficient of one, we find that a temperature difference of 8.33 degrees will be required between the egg and the surrounding air; in order to get that heat out of the egg, we must have a temperature difference, or a temperature gradient, or a temperature difference, in order to have the heat flow from the egg.

336 A. (Continued) Now, supposing instead of placing your eggs on the 17th day between eggs of the same heat generating capacity, or the same temperature, supposing that tray of eggs is placed between two trays which are in the earlier stage of incubation, taking, for instance, three or four, or any place up to nine or ten days, those eggs are not radiating heat. They are receiving heat in the very early stages, and therefore, their surface temperatures are not above the air temperature; if those eggs are not generating heat, then their surface temperatures are below the air temperature and the heat will be radiated from these hot eggs and in that case you have the benefit of the radiant heat for two temperatures, particularly in the case of the later stage, that you will not have if you place those eggs in eggs of their own temperature or own stage of heating condition. Now, as I stated before, the radiation co-efficient in this case is approximately one or substantially the same as the convection co-efficient, but, for the purpose of this discussion, we are not allowing the full surface of the eggs or radiation. We are only allowing the projected area at the top and the bottom of the tray. The ratio of the projected area of those eggs,

to the total surface area is 4.88 divided by 7.16, or 68.2 per cent. That means if we had a condition in which the temperature difference between the surface of the egg and the surface of the egg next to it, was the same difference as
337 the temperature difference between the air and the egg, then that egg would radiate 68.2 per cent as much heat as it would convey by the convection current. Now, of course, so far as the percentage radiated, the percentage of heat between the two, that depends upon how the eggs are placed and what stage of incubation they are in, and what their arrangement is,—there are so many things, but it is very obvious that if the eggs are placed in an incubator so they start from the top, as they do in the Smith machine, and move downwardly as they progress, between eggs of substantially the same heat condition, or the same generating capacity, so any layers of eggs that are underneath will be hotter eggs, and those above will be just a little bit colder eggs, and therefore, there will be practically,—they will be in no position for taking advantage of that proportion of the heat which might be radiated from the eggs, and all of the heat in that case must be driven off by convection current. Now, if we take the other case, or take a condition in which the various stages are mixed up, and we put the cold eggs in with the warm eggs, as is the case with the Snow incubator, then only a part of that heat will have to be taken off by convection currents, and the remainder will be taken off by radiation, and in this condition the percentage taken off by radiation, or interchanged by radiation, will be very much greater than it is in the first case. We could work out many problems through that, but that demonstrates that radiant heat is a very important factor in the question of incu-
338 bation. As far as I have seen in any of the patents discussed here, I do not recollect that radiant heat has been talked about. I have read the Smith patent very carefully, and I cannot find anything in that about radiant heat. Smith has actually built his machine, and purposely placed those eggs of like temperatures in like elevation, and he has placed the hot eggs at the lower part of the incubator, where all of the heat is driven off, and he has specifically designed a machine which would carry air currents or air columns down and force those currents up through those eggs for the purpose of taking off this high temperature for this heat. He has not considered radiant heat in the arrangement of those eggs. He has not spoken of it. Snow's incubator takes that into consideration, and it is not a question of the eddy currents alone in there. It is a question of the placing of the

eggs and the function of the incubator and what are we trying to do? We are trying to regulate the temperature in the incubator and trying to regulate the temperature of the eggs and trying to transmit heat from egg to egg. Snow has a much more logical arrangement than Smith has to that, and everything in the Smith patent describes specifically the fact that he has laid out the machine,—a particular machine for hatching in a broad way to take the heat off in a particular method and circulating that air in a definite particular method. Snow has not done that. He has arranged his eggs in different layers.

339 Q. State whether Snow's arrangement and the method of circulating the air is such as would get a better advantage from the radiant heat on the eggs.

A. I don't know as I just understand that question.

Q. Perhaps I made a mistake. I will change the question: Which of the two machines have the best arrangement for getting the benefit of radiation from the eggs?

A. Snow's.

The Court: That is what he has been arguing on for the last half hour.

Mr. Williamson: I suppose so, but I want to get it definitely stated.

The Witness: Well, that is substantially all the argument I have to make. There may be a few points that I have missed, but those are the facts of the case. Radiant heat has not been recognized in those incubators and it has been an extremely important factor and it has not been recognized in many cases of heat transmission until recently.

Mr. Williamson: I did not hear that.

The Court: He said heat radiation had not been given enough consideration or enough emphasis by these incubator people.

The Witness: That is substantially what I wanted to bring out.

Q. Were you through?

A. I think so.

340 Q. Did you use any diagram or sheet that you wanted marked?

A. I have got some notes of my own.

Q. Didn't you have a heat unit, or is that already in?

A. That is already in evidence.

Q. That is the plaintiff's evidence?

A. Yes.

Q. Now, Professor Rowley, you testified that you heard Mr. Taggart testify in this case. Did you pay any particular attention to what he said about the tests,—his tests of the plaintiff's specimen of the Smith machine, and his test of the plaintiff's model of the Snow machine? Did you give any particular attention to that part of his testimony?

A. Well, I heard that part of his testimony and I have seen, of course, the tests, that he introduced, but I didn't get very clearly how he took all of that detail he had.

Q. That is not what I am asking you. I am asking you did you hear his testimony?

A. Yes.

Q. He introduced more or less detail sheets, and I don't remember what general term he called them by, to make clear the nature of the results of his tests. Have you considered those?

A. I have.

Q. Please state whether or not you agree or disagree
341 with Mr. Taggart's testimony regarding those subjects, and if you have any criticism to make of his tests or the reports of his tests, that were put into evidence, and the diagrams or drawings that he put in, do it in your own way, as briefly as you can, consistent with clearness.

A. I will have to see those diagrams.

Q. Take them up in regular order.

A. As I have it here, the diagrams or test data shown here, for the Smith incubator are marked Exhibit 7.

Q. Plaintiff's Exhibit 7.

A. Plaintiff's Exhibit 7.

Mr. Williamson: Do you refer to this diagram?

The Witness: Yes, that is it. Now, in examining the test data, as shown on these diagrams, there are some points that are difficult,—

Q. You better give the diagrams by the exhibit numbers.

A. Taggart's diagram, Exhibit number 7, showing the Smith incubator. There are points on here that are difficult for me to analyze. I have not been quite clear as to just what the object of these tests were,—just what it was intended to represent by this data, that have been shown upon these various diagrams. Now, referring to the first page of Exhibit number 7, which is marked, "Sectional view across machine through fan," this would seem to indicate that those were the directions and velocities of the air through that sec-

tion of the incubator. Now, to begin with, I don't
342 know just how Mr. Taggart measured those velocities, but I understood he used an average ordinary anemometer, and I understood he had made those tests without disturbing the curtains or anything, with the curtains in place, and yet, I find velocities in here in the egg chambers throughout this view and also throughout the view, Exhibit B, which seem to be a section through the trays midway from front to rear. I find the velocity through there. If these were taken with the curtains in place, I don't see just how, by an ordinary anemometer, those readings or those points, without raising the curtains, or disturbing it in some way, or some method used not indicated in the test, could be made. For a scientific test, that ought to be determined and it should not be left for imagination.

Mr. Ely: Did you see the windows in the machine?

Mr. Williamson: Now just a minute.

The Witness: I saw the window in the machine.

The Court: He refers to those windows which you use in looking through the anemometer.

The Witness: Your Honor, I understood that was shown there for just one place, and these readings were taken all along both sides. I only saw a window in one place in this test.

The Court: I don't know whether the testimony shows the windows all over it or not.

Mr. Williamson: It only had one window.

343 The Witness: I of course, have to determine only what I could get. If I am wrong, I would like to know the facts. I am trying to analyze these things on a fair basis.

Q. He only had one window.

A. And furthermore, if I were to interpret the drawings, Exhibit Number 7, in the corridor I find velocities there which are indicated at the top 1140 near the fan, and immediately below that 950, and then at the center of the right is 600, and at the lower left is 500. That is for the cross-section or the distance from side to side of the corridor. Now, that corridor is approximately the same width, or fully as wide as the space is between the two fans. In interpreting this drawing, I would feel justified in thinking that that represented the average downward velocity in the corridor, or I would es-

timate in that case, without further data, that the downward velocity, as Mr. Taggart has found it, was approximately 600 feet per minute, through the cross-section of the corridor.

Q. You mean that is what he represents?

A. That is what this drawing represents. Now, I turn to the drawing, Exhibit 7-A, the last of the set, and now I find here a longitudinal section through the corridor in which there are many arrows downwardly, but I do not see anything to reinforce my opinion either way as to what the velocity in that corridor there—there are no figures
344 given here, and yet, here is a place where it would be very easy to take some figures or take some readings and show the downward velocity in this corridor, and yet I see no figures in that corridor and, therefore, I am compelled, as an engineer analyzing these plans, to assume that the corridor downward velocity is about at least, I would say, through the central section, at least 600 feet per minute. Now, taking the sides, that air which comes down through the corridor, if it is all downward as shown in this cross-section through there, it would have to come up under those trays. It would have to come up on the side unless there were some other velocities upward, which are not shown here. Now, taking the side section, or the section of the trays at the side, through the same center line,—

The Court: You mean here? (indicating).

The Witness: No, pardon me,—I mean right through here along this line, (indicating). I am trying to get an average line through the center of the machine because all the air going down through that corridor must come back and up through these trays. Now, taking the right hand side on approximately the same line, I find that the average figures show 75 feet per minute,—that is the anemometer reading.

The Court: Where do you get that?

The Witness: By averaging all these up.

The Court: On this line?

345 The Witness: Yes, I took the average right through there and that is the average of all this data. Now, on the left hand side, likewise I find that the average is 85 feet per minute. There were no trays in there, and that was free space, which it is not, of course, but, if it was free space in there, with those velocities, then the average velocity of the two sides would be approximately 80 feet per

minute, and since there is approximately twice the area, if we consider it free area, then the total equivalent velocity for an equal area to the corridor would be about 160 feet per minute. Now, that does not check the air coming down,—even considering the free space, the air coming down seems to show something like 600 feet per minute. The air over the equivalent area going up seems to indicate about 160 feet per minute. Now, if we turn further in this set of drawings, to the drawing, Exhibit 7-B, which is a vertical section through the center line of the trays, and these velocities which I have been considering on the two sides, are indicated as velocities between the line of the trays, and Mr. Taggart has told us, I believe, in his testimony, or at least I understood him to say that the velocities between these lines of trays are greater than the velocity up through the trays, and, therefore, in allowing 75 feet per minute as the velocity on the right hand side, and 85 feet on the left hand side, and even calling that all free area, which is extremely liberal, and yet, I find it does not check. Now, the question is, that
346 these do not mean anything. I do not see, if this is an engineering report, how we can analyze this and get anything out of it, as to what it means. What are these arrows for, and what are those figures for? Do they mean what they show, or don't they show what they think they show? I don't know. At any rate, I cannot analyze it. Now, that only applies to this Smith incubator. As I turn to the next set of drawings,—

Q. While you are on the arrows,—you have just made reference to the arrows on Mr. Taggart's diagram?

A. Yes.

Q. I would like to ask you whether you find any justification for the arrows being placed like they are.

A. No, I cannot find any in this drawing, because if they mean what they indicate, it would surely indicate that the velocities downward through that central corridor is 600 feet, anyway, per minute, and it does not correspond. If they mean something else, then I cannot interpret it from this drawing. It is a very difficult thing and almost impossible to show a vertical section or a plane and a sectional view of an air column, which is nothing more or less turbulent there in their arrows, which indicate the direction of it,—the predominating direction of the velocity. It doesn't show anything about it. You are trying to show three dimensions in one plane. You are trying to show the motion

or velocity in three dimensions in one plane and you
347 cannot do it, and this shows it. Now, that same thing is brought out, it seems to me, very forcibly, in this next set of drawings.

Mr. Ralph Williamson: Those are Plaintiff's Exhibits 12 and 12-A and 12-B and so forth?

The Witness: I will refer, then, to Plaintiff's Exhibit 12, and so forth. I don't know the numerals.

The Court: They are on here, starting in with 12 and so on down.

Mr. Ralph Williamson: Exhibit 12-K is the last one.

The Witness: Now, as I look at this set of drawings, it seems to me that there has been an elaborate amount of work put on their preparation. No man could prepare an engineering report of this kind and show the data shown here, and show it correctly without an elaborate amount of work. There seems to have been a definite impression or a definite attempt to create an impression of certain air currents, or the directions. Now, I haven't gone into this to define or to show whether the in and out currents, as shown, are proper, because it would be practically impossible. There are no specific channels through which the air must pass, as there is in the Snow machine, and, therefore, it is not possible,—as there is in the Smith machine, I should say, and, therefore, it is not possible to make that kind of an analysis, but, looking at this first drawing, for instance, it would appear to me, if these arrows mean what they show in
348 engineering language, that there are no definite currents established in certain planes.

Q. Indicated there, is that what you mean?

The Court: Indicated by the arrows.

The Witness: Yes. Now, of course, in this the easiest place to take a few anemometer readings if you are going to take anemometer readings,—I don't know whether I have explained it, but if you take an anemometer and take it in a turbulent air current you get component force or the component velocity in the plane of the anemometer, but you do not get the other angle to it. In other words, the anemometer may rotate and show the upward movement of a mass of air, but it does not show the current or the direction of the current in that area only in that component direction, as shown by the anemometer, and, therefore, to begin with, I do not accept an anemometer as a proper means of measur-

ing currents unless you should have an elaborate mind, an unbelievable mind respecting these eddy currents, and you should take an unbelievable number of records. It is not scientifically correct, but the data must be presented here for scientific reasons. In looking at that drawing, the corridor, which would be the easiest place to get velocity, and by using an anemometer, it doesn't have a single velocity shown. It has plenty of arrows, but the velocities are not in there. In the other places, where it seems to be it is the intent to establish the air current, there are plenty of velocities
349 and arrows. Now, I want to refer next,—I cannot analyze all these points because it is impossible. I would like to refer next to the drawing 12-AA. On that drawing I find velocities shown along the back walls, next to the agitators. I find those velocities there,—Mr. Taggart stated he opened up the trays to get those velocities. I understood he opened up the trays to hold the anemometer in there. If that is the case, when you push those trays apart for a man to get in there, the size of Mr. Taggart, you have certainly disturbed these air currents, and what you get by the anemometer means nothing. Now, I would like to point out one or two cases in here where even by separating those trays apart I do not see how readings could be taken. For instance, take the readings directly below the left hand agitator, which is at the back of the incubator in the plane of the agitator, now to take that reading, the anemometer must be placed so that the plane of the anemometer wheel is perpendicular to the back walls. If you push that anemometer back in there in that position as shown here, you cannot read it, unless you fix up some special device for reading it. You cannot read it by any anemometer I have seen exhibited in this test, and, furthermore, if you try to spread those trays and go back there is a screen or net on top,—if you spread those trays to go back, the only way you can put that anemometer in there, as I can see, is to reach over the back down past that moving blade. I do
350 not see how that is taken by any data which is shown here.

The Court: You would have to reach around it?

The Witness: Reach around over the screen and back over the blade in there, unless there is some special device not indicated here or not exhibited. I do not see anything there by which you could do it. There is a line of readings along there that I might dwell upon, but I do not care to do that, and I don't think it is necessary. I want to take just a minute on drawing Exhibit 12-BB. Now, BB, it states here

that it is a sectional view in a plane parallel to fan and approximately six inches in front of fan. On the left side below on that drawing are several marks indicating circles and figures, and in those figures are either plus, minus or plus and minus, which state, as I understand it, that that is the position,—that it represents the position in which the anemometer was placed in the plane, at which the data were taken. The plus indicates air flowing to the fan, and the minus in the circle indicates air flowing away from the fan. The plus and minus indicates that the anemometer does not run steadily in one direction, and then over at the upper right hand side there is another arrow with the figure 100 over it, as an illustration, I believe, which states that the arrows show cross current to an anemometer. The number gives their approximate speed. Now, from those legends, or from

351 those notes, I would interpret that if there were cross currents to the anemometer, it would be so indicated by one of these arrows, and, in fact, there are several places near the bottom of the drawing, or the diagram, in which such arrows are indicated, showing cross currents. Now, from this diagram, I find all through the central portion of this section that there are no cross currents. Either the air must be moved in or it must be moved out, because there should be cross arrows there if it doesn't. In other words, this diagram tells us that all of the air in the plane, which is near the blades of the fan, is either moving directly in or directly out, or directly in and out. There are no cross currents that I can find there, or, if there are, they are very minute. In other words, he would have us believe that this is a diagram which represents air currents and those air currents are directly in or directly out in that plane, excepting at the bottom, and at the top there are a few which show otherwise.

Q. Is that right or wrong?

A. If we take Section BB, on sheet 12, the only point where we have an indication, where the arrows are shown, there—are shown in that section going upwards and downwards in various directions, and, therefore, they could not be directly in or out in that plane, and all of the tests which I have tried to show back in there they do not go in or out at that plane.

Q. You mean you haven't found them in or out?

352 A. I haven't found them in or out. I found them mixed, and I found them predominating in around the blades, but not in or out. If this diagram so stated that it is an indication of what Mr. Taggart thinks, I might accept it, but if this diagram tells us as close as Mr. Taggart is able

to tell us what is going on in the air currents in that incubator, I cannot accept it. Now, I might go through diagrams CC and DD, and add the same criticism. As I look at diagram DD, it shows the same thing; that is a diagram taken along the line DD, or in the plane very close to the outer end of the trays. Now, as I would interpret that diagram, those air velocities all over the trays are either in, directly out, or in and out, and there are no forward or up and down movements, as I found in my test. I think it is necessary to bring this out because our test data do not agree, and it is going to be necessary in analyzing that to settle on either one or the other.

These test data are entirely different records.

Q. Go through them and point them all out where they are wrong; that is, in a general way. I do not mean to go into detail with every sheet, but, just generalize.

The Court: I think he should state generally upon that. If he will take these sheets it will take us too long.

Q. Generalize it.

A. Those same criticisms and many others that I have not pointed out on different sheets, are here. There
353 are very few places where I can find in these data sheets where actually claimed arrows or intersections are crossing on the line. At these places, we have a line, and if the direction of the air in one plane is along that line, then, obviously, it must be along that same line in the other plane which intersects it. It could not be otherwise. Now, the only, or the one place in that that I have noted here, and on diagram 12 we have the arrows representing, I suppose, in that plane the direction of the air-flow in that plane. On diagram EE, we have another plane intersecting this plane, which also shows arrows. On this diagram 12 we find a specific point which is just at the right of the air exit, and I have lettered it on my drawing as "A". That shows a definite current of air, a straight line, of 580 feet from right to left. Now, if I take this same point and plat it on plane EE, which goes perpendicularly to this, I find that it meets the same place at a point where there is a downward eddy shown, instead of a horizontal line, or, in other words, this is the line here, and that line on this drawing shows this air current, which is moving from the lower to the upper part of the diagram. On the other diagram, it is moving from right to left. That same point on diagram EE does not agree. If this diagram, then, were correctly drawn, this

diagram EE, it should correspond at that particular point with the point on 12.

Q. In diagram 12?

A. On diagram 12. Now, we cannot obviously
354 analyze all these data, because we would never get through.

Q. You mean the data relating to the Snow machine, or both machines?

A. I have already analyzed that on the Smith. I am now on the Snow machine data, as given by Mr. Taggart. Now, I want to refer to the drawing FF.

Q. That is, Plaintiff's Exhibit FF?

A. Plaintiff's Exhibit 12-FF. Now, in this drawing I find it is a section in a horizontal plane, and, therefore, when arrows are positively drawn it would seem that they indicate that the flow of the air is in that horizontal plane, and since this represents a plane between the trays, it would indicate that the flow is parallel between those trays. In fact, there is a note on this drawing, next to the last, on the right hand side, which says, "Arrows in trays show general direction proximating the speed of the air currents passing through columns." I would say from that, an arrow in that tray should show the approximate direction of that air. Then there is another note at the top, which says, at the top left: "Circle in trays in position of reading of the anemometer when placed flat on bottom of tray." The next note, which has a circle with a plus in it, has a headline, "Plus readings indicate air moving downward through bottom of trays." The next note says, with a minus sign, that the minus means arrows moving upward. I would like to take one point here,
of which there are many, as an illustration, and that is
355 in the tray farthest to the left there is an arrow in the center of that tray forward and horizontally, which has on that arrow "320." Now, that would indicate that the air velocity or the air-flow in that tray is in substantially a horizontal direction because it is a horizontal plane and moves forward at 320. That is the impression which would be given. Right beside that, however, there is a circle with a plus in it, which says, "350." That circle would indicate, from the figure there, that the air is moving upward at 350. Certainly, that arrow cannot be relied upon to show the direction and the flow of that air. If that is flowing in a horizontal direction, it is 320. How can it be flowing in that direction, or a direction perpendicularly to the trays at 350? In other words, these drawings have shown large numbers of arrows. As you look at this throughout, there are arrows in here, plane after plane horizontally. There are plane after plane

throughout the fan or the agitator, and these are filled with arrows, so the directions evidently intend to show or prove that that air is moving directly towards those fans, and yet we find some other arrows here merely put in, perhaps, but they are there, where they might indicate that it is moving up and down.

Q. Are those arrows to be relied upon in that case?

A. I don't see how you can rely upon the arrows. I do not see how it is possible to rely upon the arrows which are giving such information and apparently such erroneous
356 information. It is an impossibility to draw from these plans an accurate or anything like an accurate opinion of what is going on, or what I have found to be going on in my tests in those machines. Now, if we continue, and I want to make this brief,—if we continue we find the same drawings or the same diagrams in Exhibit,—

Q. Not the same,—you are taking up another set, aren't you? A. No.

Mr. Ralph Williamson: Exhibit 13.

The Witness: We find the same data there shown in colored drawings.

Q. The same representations?

A. The same representations shown in colored drawings. Those colors are put in there to reinforce the idea apparently that the air moves in and out, and in certain definite channels. It has the same note on there, stating that the arrows show the general direction, and these data were taken from the former sheets, so far as I know, but I do not see anything in here in regard to the colors, but I believe it was explained in Mr. Taggart's testimony.

Q. This model?

A. The color in the very elaborate diagram, or in the elaborate model, wherein the red shows it flowing in, and the blue shows the air flowing out.

Q. You mean Plaintiff's Exhibit 14?

357 A. I mean Plaintiff's Exhibit 14.

Q. You mean that little model?

A. I mean the little model over here. I understood on this model, Exhibit 14, it was intended to show the facts as he had found from the flow of this air in and out, and I expect that was taken from this data that was shown on the diagram.

Q. Go through those sheets, as fast as you can.

A. These are a duplication, so far as I know, of the data shown in the sheets which I have covered, and the point that I want to make is that I cannot analyze these and get an ac-

curate record or anything like an accurate idea of what is going on.

Q. Could anybody else do it, do you think?

Mr. Ely: I object to that as improper.

Q. Any engineer,—a mechanical engineer? I will withdraw that.

The Witness: Now, of course, such a set of drawings might be shown, prepared so elaborately by some commercial artist if he wanted to put across to the public this matter, but for an engineer to prepare a drawing like this, I cannot see how they can represent what ought to be represented or what I found in the tests which I made on similar machines. I cannot analyze this data and get out of it what these drawings would offer to represent to the inexperienced man. I do not think there is any use of my going into more detail.

358 Q. You think you should not go into them separately?
A. No.

Mr. Williamson: Could we have a two or three minute recess?

The Court: Yes.

(Recess.)

359 Q. Professor Rowley, did you pay close attention to Mr. Taggart's testimony about the structure and operation of the Snow machine as it was exemplified in the plaintiff's model, so-called model of the Snow machine in evidence on behalf of the plaintiff and as it was based on the machine which he had seen at Sleepy Eye at the time that you made the test you referred to? Did you pay close attention to that testimony? A. To the testimony? Yes.

Q. What is that? A. Yes.

Q. Did Mr. Taggart give a correct description of the structure and operation of that Snow machine as you understand it? A. No.

Q. Did he correctly describe either one of them according to your understanding? I mean the air circulation in either one of them according to your judgment? A. No.

Q. Please state what the word "current" means as that word is used in the mechanic arts by mechanical engineers and others.

Mr. Ely: Oh, I object to that, Your Honor. We are going far afield.

Mr. Williamson: Well, I want him to state what it means. It won't take but a minute.

The Court: He can state what he means by currents.
360 I thought I understood it but maybe I don't.

A. My understanding of current is a continuous flow in one direction or a continuous movement in one direction.

Mr. Williamson: Now, the defendant offers in evidence a certified copy of the file wrapper record of the Smith patent in suit, number 1,262,860 of April 16, 1918, and requests that it be marked as Defendant's Exhibit O, and with the words "File wrapper record of the Smith patent in suit."

The Court: It will be received. That is the file wrapper of Smith?

Mr. Ely: Yes. May I interrupt just a minute. We have a photostatic lithographic copy of that, Your Honor, and I would just like to hand it up to you. We will give Mr. Williamson another one which we have had made and which I think is easier to read.

The Court: It would certainly be easier to examine and you can look at them and see if there is any difference.

Mr. Williamson: Sure, all right.

The Court: You marked that Exhibit then?

Mr. Ely: That is much easier to read than this blue and white, I assure you it is correct.

Mr. Williamson: I am going to offer this but I am perfectly willing to put that in too.

The Court: All right. Received. If there is any dif-
361 ference why you can point it out.

Mr. Williamson: I want this one in.

The Court: I understand. I will admit that one in, but we will use this one.

Mr. Williamson: That will be all right, Your Honor.

The Court: Which patent is that?

Mr. Williamson: The patent in suit.

The Court: Well there is only one patent here.

Mr. Williamson: You better take the number of it. It is 1,262,860.

The Court: That is given in the complaint.

Mr. Williamson: Yes, on April 16, 1918. That is the Smith patent.

Q. Professor Rowley, have you read and do you understand that file wrapper record which I have just offered in evidence of the Smith patent in suit? A. I have.

Mr. Ely: Object to that, Your Honor, I don't see how that is material.

Mr. Williamson: That is customary and it is material.

The Court: Overruled.

Q. Have you read and do you understand all the prior patents which were referred to on that file wrapper record and cited as references against claims presented in the
362 Smith application? A. Yes.

Q. Have you also read and do you understand the additional patents set-up in the answer in this suit and stated to be relied upon by the defendant in this case?

A. I have read all of those that—I haven't checked the numbers, but I have read them all.

Q. Do you understand them? A. Yes, sir.

Mr. Williamson: I have here, Your Honor, a portfolio which contains copies of all the United States Patents that were cited as references on the file wrapper record and also a certified copy of the German patent that was cited on the—there is a German patent that was cited on the file wrapper record and which also contains the additional patents set up in the answer and also stated, in response to the order to show cause, upon which we would rely, upon which the defendant would rely, and I offer the said portfolio and all of the said patents with the understanding that the reporter will separately mark those patents with the name and number of each patent, so that if they should happen to get dislocated from this portfolio they could be found, otherwise I have got to offer them one at a time.

The Court: Those would be marked different exhibits?

Mr. Williamson: I would like to have the portfolio
363 marked "Portfolio containing patents relied upon by the defendant."

The Court: And mark the Exhibit P. Received.

Mr. Williamson: And marked Exhibit P, yes, but for fear these would become detached I would like them each marked

Defendant's Exhibit, and the number of the patent, otherwise they might become lost or confused.

(Defendant's Exhibit P, "Portfolio containing patents relied upon by the defendant," marked for identification by the reporter.

German Stulik Patent, 155,917, November 7, 1901.)

Patents cited in file wrapper record.

Winkler, 286,756, Oct. 16, 1883.
Bassini, et al., 330,457, Nov. 17, 1885.
Campbell, 344,474, June 29, 1886.
Morgan, 591,870, Oct. 19, 1897.
Bell, 691,837, Jan. 28, 1902.
Scott, 709,650, Sept. 23, 1901.
Perkins, 745,458, Dec. 1, 1903.
Boyd, 828,181, Aug. 7, 1906.
Koons, 916,454, May 30, 1909.
Goldstein, 1,137,752, May 4, 1915.
VanKeuren, 1,160,793, Nov. 16, 1915.
Endemann, 120,253, Oct. 24, 1871.
Jones, et al., 152,644, June 30, 1874.
Morgan, 272,744, Feb. 20, 1883.
Conant, 297,676, April 29, 1884.
Christianson, 559,676, May 5, 1896.
Verna, 891,019, June 16, 1908.
Klinke, 949,653, Feb. 15, 1910.
Olson, 1,100,146, June 16, 1914.

Patents set up in answer not cited in file wrapper record.

Guerin, 3,019, Mar. 30, 1843.
Johnson, 360,223, March 29, 1887.
Proctor, et al., 426,321, April 22, 1890.
Proctor, 553,723, Jan. 28, 1896.
Peters, et al., 843,909, Feb. 12, 1907.
Wiebe, 992,622, May 16, 1911.
Schmidt, et al., 1,010,809, Dec. 5, 1911.
Zimmer, 1,075,747, Oct. 14, 1913.)

Mr. Williamson: Now, I have here, Your Honor, a book entitled "Ure's Dictionary of Arts, Manufactures and Mines" which was published, as you will see, by Long-
364 mans, Green, and Co., England, London, 1867, and I call your attention to what appears on pages 652 and 653 of that book.

The Court: What is the title of that book?

Mr. Williamson: "Ure's Dictionary of Arts, Manufactures and Mines, Volume II," pages 652, 653. Now, we have a stipulation that photostats of publications can be introduced and we have had a photostat,—and to the particular article there appearing entitled "Incubation, Artificial," and we have had photostats of that article taken, and we have a stipulation that photostats may be introduced.

The Court: Incubation, what is that?

Mr. Williamson: "Incubation, Artificial," and as I say we have a photostat which is enlarged, from that same article which you can more easily follow. You can read that much more easily and with your permission I will read part of this and point out the structure that is shown in the cut on page 653. "The Egyptians have from time immemorial been accustomed to hatch eggs by artificial warmth, without the aid of hens, in peculiar stoves, called Mammals."

Mr. Ely: Pardon me, just a moment. This is going in. I don't see any reason for just sitting back and listening to Mr. Williamson read this.

Mr. Williamson: Your Honor, this is very important, and this is my testimony.

The Court: I take it he wants it in the record.

365 Mr. Williamson: Yes, and I want to show you this structure. It is very important. "M. de Reaumur published in France, about a century ago, some ingenious observations up on this subject; but M. Bonnemain was the first person who studied with due attention all the circumstances of artificial incubation, and mounted the process successfully upon the commercial scale. So far back as 1777 he communicated to the Academy of Sciences an interesting fact, which he had noticed, upon the mechanism employed by chicks to break their shells; and for some time prior to the French revolution he furnished the Parisian market with excellent poultry at a period of the year when the farmers had ceased to supply it. His establishment was ruined at that disastrous era, and no other has ever since been constructed or conducted with similar care. His apparatus derives peculiar interest from the fact that it was founded upon the principle of the circulation of hot water, by the intestine motions of its particles, in a returning series of connected pipes; a subject afterwards illustrated in the experimental researches of Count Rumford. It has of late years been introduced as a novelty into this country, and applied

to warm the apartments of many public and private buildings. The following details will prove that the theory and practice of hot water circulation were as perfectly understood by M. Bonnemain fifty years ago, as they are at the present day. They were then publicly exhibited at his residence in Paris, and were afterwards communicated to the world
366 at large in the interesting article of the Encyclopedie Technologique, entitled 'Incubation Artificielle,' under the head of Regulateur de Temperature."

Mr. Williamson: Then he goes into a detailed description of his apparatus and instead of reading that to you, Your Honor, I will point it out, the details. Over here is the cut. There are a series of trays superimposed one upon the other. Then out towards the left there is an extension from the lowermost part of the incubator proper, which he calls a nursery. Then he has over at the right end, a little beyond the right end of his main incubator, he has got what he calls a boiler with pipes extending above and below each of the trays in which he puts his eggs.

Mr. Ely: Pardon me.

Mr. Williamson: That is just what it is.

Mr. Ely: I know, but is Mr. Williamson subject to cross-examination, Your Honor?

Mr. Williamson: I will make myself subject to cross-examination on this if you want me to do it.

The Court: Of course he is reading this.

Mr. Williamson: It would tire the Judge out for me to read all of this detail to him.

Mr. Ely: That is what I want you to use.

The Court: Of course, it isn't received as evidence. It is part of his argument.

367 Mr. Williamson: My statement. Now, that is about the structure, but that is the way he describes it, and I could verify it by the detailed description. But I didn't finish. Now these hot water pipes, as I told you, run above and between the trays and out through the nursery and come back again to the boiler and are kept in a continuous circulation so as to keep that temperature in the incubator at the proper degree of heat which he states to be a hundred degrees down here and they heat that boiler, the fire in that boiler is controlled by a thermostat so that that heat is maintained

constantly at this desired degree of one hundred degrees. Now I want to read—that is the structure. Now I want to read what he says about the way he handles it.

"When we wish to hatch eggs with this apparatus, the fire is to be kindled in the boiler, and as soon as the temperature has risen to about 100 degrees F., the eggs are introduced; but only one-twentieth of the whole number intended, upon the first day; next day a like number is laid upon the trays, and thus in succession for twenty days, so that upon the twenty-first day the eggs first placed may be hatched for the most part, and we may obtain daily afterwards an equal number of chicks. In this way regularity of care is established in the rearing of them." It is staged incubation.

"During the first days of incubation, natural as well as artificial, a small portion of the water contained in
368 the egg evaporates by the heat, through the shell, and is replaced by a like quantity of air, which is afterwards useful for the respiration of the animal. If the warm atmosphere surrounding the eggs were very dry, such a portion of the aqueous part of the eggs would evaporate through the pores of the shells as would endanger the future life of the chick in ovo. The transpiration from the body of the hen, as she sits upon her eggs, counteracts this dessication in general; yet in very dry weather many hatching eggs fail from that cause, unless they be placed in moist decomposing straw. The water saucers N N are therefore essential to success in artificial incubation.

"After the chickens are hatched they are transferred into the nursery, O Q, on the front side of which there is a small grated trough filled with millet seed. Small divisions are made between the broods of successive days, to enable the superintendent to vary their feeding to their age."

"In order to supply"—well, he goes on then and states how valuable that is.

Now, that is the structure, and the book states that this was in commercial use in 1777, but the book itself was published in 1867 and we have the benefit of the date 1867 as the disclosure of that structure which shows staged incubation and temperature control and moisture supply, all as in use in modern incubation, way back there.

369 Mr. Williamson: Defendant offers in evidence the photostat of the two pages of Ure's Dictionary of Arts,

Manufactures and Mines published in London, England, by Longmans, Green, and Co., 1867, one photostat being of the title page of that book, and the other photostat being of pages 652 and 653, volume II of that publication.

The Court: That may be received.

(Defendant's Exhibit Q marked for identification by the reporter.)

(Adjournment taken until November 22, 1932, at 10 o'clock A. M.)

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370 November 22, 1932,
At 10 o'clock a. m.

Hearing resumed pursuant to adjournment.

Court and counsel present.

Mr. Williamson: May it please Your Honor, before we proceed with the witness, on reading the transcript of yesterday's testimony, at the time that I offered this portfolio of patents, I thought that I had also, when speaking of the German Patent to Stulik, Number 155,917, of November 7, 1901, I thought that I had also said: "And a certified English translation of the German in that patent," but on looking at the transcript, it looks as if I had overlooked that, and I would like to have that inserted in the offer, and I will offer that now.

The Court: Very well, it will be received.

Mr. Williamson: The certified translation is bound in the volume.

The Court: Very well.

Mr. Williamson: Now, there is one more thing: On looking through the portfolio which was offered, I find that one of the United States Patents set up in the answer, and also cited as being one of the number that will be relied upon in my response to the Court's Order, to-wit, the patent to Renwick, 193,616, of July 31, 1877 by some oversight, it was not bound into the portfolio, and I ask permission to have it bound in?

371 The Court: That may be done.

Mr. Williamson: Thank you, very much.

The Court: Gentlemen, I wish to make inquiry of you: Do you contemplate that this case will be finished tomorrow?

Mr. Williamson: I am unable to state; it depends altogether upon what the other side will put in rebuttal. I will try to expedite our side of the case as fast as I can.

The Court: Well, day after tomorrow is Thanksgiving Day, and we will not hold court on that day; I will declare a recess for that day, and I just wanted to know.

Mr. Williamson: I will try to expedite it just as fast as I can.

The Court: Well, if necessary, I will hold a little longer hours, so as to get through, and I won't do that unless it is necessary.

Prof. Frank B. Rowley, recalled, testified as follows:

Direct Examination.

By Mr. Williamson:

The Witness: Now, Your Honor, I would like,—before I go ahead, I would like to refer back to our discussion which is recorded in the final record on page 306, as to what would happen in the Smith incubator without the curtains. You asked that question, I believe, and I defined it. Sunday, I went down to the incubator that we have and actually
372 took the curtains off, and tried out the test; that is, I did not make a complete test, but I tried the circulation, to see where it would go, and determined at the left side of the corridor,—that is, the air in on the left side at the bottom, and also the circulation on both sides.

Now, this is what I find: The circulation, or rather, the flow of air inward from the corridor toward the wall, on the left side of the bottom, where I placed those anemometers, was somewhat lower.

Now, I took anemometer readings all along these twelve same places which I said I had taken before, and I found the average in-flow rate in feet per minute to be 162, and, as I had it there now, I find that that was 198; so there was less air actually flowing under.

Now, as to the circulation, the air passed down from the fan, which we have described, in a cone, and it passed down to the floor, nearly to the floor. At the lower side there, of course, you cannot tell, because it was mushrooming out, and it passed in under the tray, from the bottom, up about eighteen inches to two feet, or thereabouts; I could not tell the exact place. From there above, it was passing out the other way.

By the Court:

Q. What do you mean, it passed out the other way,—passing out in the corridor?

A. Into the corridor, yes.

Q. You mean, it made a circuit down under there,
373 striking the floor, and came in about two feet up?

A. Probably about two feet up, and came up,—it would pass into the trays for a space of approximately two feet; I did not determine that exactly; and then it went up through the trays.

Q. You mean, it would not go clear across there; you say it passed into the trays about that much?

A. Well, I don't know, Your Honor; I think some of it would go way back.

By the Court:

Q. That is what you meant?

A. No, I did not mean that; I mean that some volume *would not go in under there; I expect some of it would go* clear back to the wall. From this point, it is approximately two feet (indicating); that is, to the middle of the corridor; the air would be passing out from those trays into the corridor, and a large part of that air would actually not go up and over in through the fan, in its normal direction, but it would come over underneath the panel holding the fan, and come out of the tray, in the under side of the fan, and be brought down again, to the action of the fan.

Q. Did some get clear over?

A. Some on the outside would get clear over, and go both ways, that is, some would go to the outside, and over the top.

Q. So, according to your testimony, as I understand it, the air was passing in and down in a cone shape, and as it struck the floor, or near the floor, it mushroomed down under the trays?

374 A. Yes, and came up,—some of it came up all along on both sides.

Q. And some came clear over?

A. I did not go back there to test it, but there undoubtedly must have been some back there; I did not make a test of that kind, but a large part of it came out into the corridor, instead of going the other way, that is, it did not flow up through the trays.

Q. A large part of it?

A. A large part of it.

Q. And what do you mean by a large part of it?

A. I put a smoke apparatus,—I injected smoke under the trays about,—oh, I should say a foot, or a little over, over the floor, about the middle line of the trays, and the smoke from that stream would come up and get out into the corridor under the fan.

Q. Well, wouldn't the smoke also come out when you put it up higher?

A. Yes, it would come out even up higher, too.

Q. Well, that showed that the smoke was coming out all along into the corridor?

A. Into the corridor, just above that certain line. Now, below a certain line, it would be going from the corridor into the trays, and above that line it was coming out. That is what I wanted to make clear.

By Mr. Williamson:

375 Q. Was there any short circuiting of the air that came from the fan directly, in going to the trays, before you put it down at the bottom? Do you know what I mean by short circuit?

A. Well, you cannot tell definitely what is happening there, because there is quite a space, and there is a churning of the air as it goes down and turns up in the space above, and a short circuiting depends upon the speed of the air, and how far away the floor is from the trays, of course. Of course, in this case, the short circuiting, so to say, would be down,—about two feet from the floor.

Q. How much of that short circuiting was there above the middle of the corridor,—the middle of the vertical height of the corridor?

A. Well, it depends on there what you mean by short circuiting.

The Court: Well, he means, to come together.

By Williamson:

Q. If Your Honor please, I mean, turning back,—turning into the trays, and coming back from under the panel which holds the fan, or over to the fan, without coming down to the bottom; that is what I mean by a short circuit.

A. The air above the center line was coming out into the corridor.

By the Court:

Q. According to your testimony, it was driven down in a cone shape, and struck the floor, or near the floor, and curved up in through the trays?

A. Yes, some of it.

376 Q. It could not do anything else if it were driven down there?

A. No; some of it goes in, and it comes out above the line; it merely comes down to the floor, and, of course, whenever it gets to the floor, if it is driven hard enough to hit the floor, it is going to mushroom out. And the action is that that air is going to pass out, or balloon out, and it is going to circulate in cycles, and to the fan. Now, those currents, if the curtains were on, would pass up through the tray, above the fan, and downward through the fan.

Q. Well, that has been testified to here before.

A. In this case, they pass both ways. Some of the upper ones would pass up that way (indicating), and some of the inner ones would pass up under the fan, never getting up to the fan at all. That is the difference that I found between the curtains on, and without the curtains on.

Now, I tested the fan speed. The one fan at the end that had the screen removed, I found that to be 1678 RPM; and I tested the air velocity, and the average air velocity over the outlet of the fan, I found that to be 1200 feet per minute, as it left the average area of the fan. I just wanted to make that clear, Your Honor, because I made that test, and I thought you should know it.

Another point, before I go on, is,—we were testifying yesterday, on the question of wall temperatures in the two incubators.

377 By Mr. Williamson:

Q. Before you go on with that, you made these tests on Sunday, with the Snow specimen, and on the Smith commercial machine, did you? A. Yes, sir.

Q. Now, yesterday we were discussing the question of surface temperatures. Now, this morning, I have hurriedly made some calculations here to show the difference in the temperature between the surface temperatures, between conditions as shown in the Snow machine, and conditions as shown in the Smith machine, by Mr. Taggart's affidavit; that is, I have not myself determined the air velocities from these surfaces with the anemometer. However, they are introduced here, and, taking those velocities, and taking a wall which is built up of two layers of wood, and two layers of half inch insulation, as the wall of the incubator,—I had to make some part of the problem; that, of course, might be any kind of a wall,—I find that with a 100 degree on the inside, and a 65 degree air on the outside, the Smith machine would give, for the conditions shown in these velocities, 90.5 degrees as

the surface temperature of the wall, and the Snow machine would give 92.7 degrees, or, in other words, there would be a difference of 2.2 degrees. That is the difference that I was talking about the other day.

Now, if these walls were built with better insulation, then, of course, they both would have higher temperatures on the wall. It is a question of insulation, and of the relative value thereof, and of the relative velocity. I just wanted to make that clear.

378 Q. You did not have any new sheets there, did you?
A. Why, these are my calculations.

The Court: He stated his conclusions on that.

The Witness: I don't think that I went into that.

By Mr. Williamson:
Q. All right, Now, Professor,—

Mr. Williamson: I have here, if Your Honor please, another reference, of which you can take judicial notice, to-wit: Volume 3 of Knight's American Mechanical Dictionary, published at Boston, Massachusetts, by Houghton, Mifflin & Company, in 1884, and I call Your Honor's attention to the article and a cut which appears under the heading "Ventilator" on pages 2704 and 2705 of that publication, or that book, Volume 3. We have a photostat of it, which under our stipulation we can offer in evidence, and we do offer it in evidence, —where is the first page of it?

Mr. Ely: Well, this is all right.

Mr. Williamson: All right. We offer the photostat of these two pages of the publication in evidence, on behalf of the defendant, to be marked Defendant's Exhibit R, with the words "Photostat of Pages 2704 and 2705 of Volume 3 of Knight's American Mechanical Dictionary."

The Court: It may be received.

By Mr. Williamson:
Q. Now, Professor Rowley, please refer to such of the prior patents and publications that have been introduced in evidence here on behalf of the defendant, as you see fit,
379 and explain the same in a brief way, as briefly as you can, consistently with clearance, so that the Court can understand the disclosures thereof.

Mr. Ralph E. Williamson: Just one minute, until I get this exhibit marked.

(Document marked Defendant's Exhibit R by the reporter.)

The Court: Just a minute, gentlemen. The reporter cannot work when two people are talking to him.

Mr. James F. Williamson: Excuse me, Your Honor. I did not know he was talking to him.

The Court: Now, you can go ahead.

The Witness: Was the question complete?

By Mr. Williamson:

Q. Go ahead in your own way, taking them up in any order that you like, and make the disclosures clear to the Court, if you can.

A. Now, Your Honor, I will proceed with these, and I will go as rapiidly as I can, to save time, and make them clear.

Q. Tell me which one you are going to take up first, and then go right along.

A. The first question that I want to take up is the age of the art, to show some evidence of the age of the art of incubation.

I will just briefly refer to the articles in Ure's Dictionary, which Mr. Williamson presented yesterday, I believe, very clearly, of 1867. Briefly, I would like to call attention to the fact that there is an incubator, of a large size, which shows definitely stage incubation. It specifies one-twentieth
380 of the eggs per day. It has a heating system, a method of heat control; it has water supply for humidity, and, briefly, it shows that the problems of incubation were considered on a large scale, as early as 1867, or, as stated in this publication, prior to 1867,—in 1777, and this was described as of 1777; but the point is that stage incubation is not new; a large size incubator was not new, and from these publications, if we had nothing else, we would have to believe that it had been actually in practice in the early years, and, therefore, on that point there seems to be nothing new in the art of stage incubation, temperature and moisture and air control.

Passing on to the United States Patent Number 3,019, issued to N. E. Guerin, of March 30, 1843. Now, in this patent, in the specification or drawing appears, the best illustration to start with, to explain it, would be sheet number one,—pardon me,—yes, it is sheet number one; that is this sheet here (indicating).

Mr. Williamson: You can step up to the Court and explain it.

The Court: No, if the witness steps up here, the reporter cannot hear him.

By Mr. Williamson:

Q. Speak louder, please.

A. Referring to the drawing, an incubator is shown with a hot water system, the hot water circulating through the coils, as shown on the right hand side (indicating), over and under egg tray. In this particular illustration, the egg
381 trays are stacked, three high. It has a heating plant; it is apparently placed in a large building or a spacious building; the dimensions, of course, are not given, but, referring back to sheet number three, we get there a sectional plane view. And those incubator trays which we see in the first sheet are on the left side, along the left side of this view, that is, looking in the normal position,—next to the cylindrical apparatus, which is the boiler or heating plant for the incubator.

Now, in this there is a water trough through the center of the open space, the water trough which is specified for to be kept clean, and circulating the water for the chickens.

The chickens, as they are hatched in there, are supposed to be placed in nurseries, or they are called nests here, which are below the hatching trays, and extend around the side, as shown by "B" in sheet number three. Or, in other words, this, as early as 1843, is an incubator which is shown for hatching eggs on a large scale; it is in a large building; it is not one of these small cabinet incubators; it is a large scale operation.

Now, I don't think it is necessary to go into all of the details of that. I merely want to show in this case, that as early as 1843,—

By Mr. Williamson:

Q. (Interrupting) How is the air supplied to it?

A. I would rather go ahead in my own way. (continuing) As early as 1843, a large scale incubator was used.
382 Now, the air is supplied through ducts underneath,—circulating ducts or chambers that carry the air through.

By the Court:

Q. In here (indicating)?

A. They are over there,—they are underneath here (indicating). Unfortuunately, this drawing is not very well lettered up, and it is very difficut to follow, so as to say exactly where all these things are. The drawing is very poorly lettered, but the ducts are described as being underneath nests, carrying air to the nests, and they are in here (indicating), and it is perforated at the bottom, to get them through. That is as far as it goes, but air is indicated, and water is shown here (indicating).

Q. There is no fan or anything to carry the air, or draw it in?

A. There is no fan in this case; it is left to gravity circulation, so far as I can see; there is no fan in here.

Now, of course, many of these patents, and all of them will be prior patents, so that they are prior art, but I have cited those two, to show the age of the art. Now, the next question is, stage incubation. Stage incubation is not new. The first reference is to Ure's Dictionary. Now, Ure's Dictionary states definitely stage incubation, and, of course, that dates back to 1867, and refers to 1777; so there is no reason to believe that stage incubation is a new part of the art.

Now, I will refer next to the United States Patent Num-
383 ber 286,756, issued October 16, 1883, to C. F. Winkler.

Q. C. F. Winker? A. Yes, C. F. Winkler.

The Court: I don't see it.

Mr. Williamson: Here it is (indicating).

The Witness: Now, in this patent, the specifications and drawings describe an incubator which I can explain best by referring to sheet number one, Figure 1, that is this figure here (indicating). Now, in this incubator the heat is supplied by hot water air and a boiler, which is indicated below, with the numeral "I", or the letter "I", and that hot water from the boiler circulates up through the water pipe marked "i", into the water pan, or, you might say, the water chambers "g", which are placed above the egg conveyors.

Q. Are these the conveyors here (indicating)?

A. Yes, those are the conveyors there. The water is circulated up in these pans, and from those pans it comes down into the boiler again; it recirculates. It is a standard method, you might say, of hot water circulation. Now, the eggs are placed on this conveyor, which is just below the water heating pans, or the water heating chambers; they are practically pans in here (indicating). The eggs are placed in those con-

veyors through openings in the casing, which are marked "D Sub-1", and "D Sub-2". Now, the object of that is to place the eggs in that require different periods of incubation; for instance, the chicken's eggs or the hen's eggs
384 would be placed in here (indicating); the hen's egg would require a longer period of incubation, and would have to be placed in an earlier stage, in order to have the proper time of incubation.

Now, those eggs, if we assume that they are placed in "D", pass down the conveyor by stages, that is, eggs are put in between the slats in the conveyor, and are passed down by stages, the stage day, and each day the new eggs are placed in the slats, or between the slats of the conveyor, which are presented before the door "D", by the operation of the conveyor. The conveyor consists of slats between the chains, which roll the eggs down over a screen, which I believe is designated by the letter "C".

By Mr. Williamson:

Q. Never mind the letters.

A. (continuing) —over the screen, and after having passed down to the next incline, they are dropped down around the next roller, and come into the next incline, and so on pass down through from top to bottom of the incubator.

At the end of the incubator, the eggs,—

By the Court:

Q. This is the end of the conveyor (indicating)?

A. The lower end of the conveyor, Your Honor,—which is about the eighteenth day for a chicken egg,—the eggs are brought out on to a horizontal screen, in which position they are not turned; that is what is really the hatching compartment. Now, as they are passing down the incline, they are rolled down, and therefore they are turned in posi-
385 tion from time to time. The moisture is supplied by water pans which are placed under the incline, and are marked here by the numeral "K".

By the Court:

Q. You have already described these water pans.

A. Just above the moving conveyor, and at the lower end, is a roller, which contains a curtain. Now, the purpose of that curtain is,—

Q. Where is that on here (indicating)?

A. Right here (indicating). The purpose of the curtain is to draw it over the eggs from time to time, to shield them from the heat, so as to give the eggs a cooling period. Now,

in this case we have an incubator which is stage incubation. The eggs are started from the top and move downward; they are turned over as they go downward. It is heated by hot water; it has humidity supply, and air is taken in at the small openings in the sides of the cage or housing. I don't think that needs any further explanation.

By Mr. Williamson:

Q. All right, go right along.

A. Next I want to refer to the German Patent to Stulik. Now, first, I will briefly explain the mechanism by which this is operated, or the method of operation, and then I want to quote some from the specifications and the claims in the patent.

This is an incubator which has several trays of eggs stacked, one above the other. It is heated by warm air, which passes up through these egg trays. It has a stage in-
386 cubation; it has a control of temperature, and I can best explain it, probably, by referring to Figure 1, in which the heating compartment is outside, or, the hot air passes up through the opening, indicated by the arrow "K"; the warm air passes around a pipe "C" up through the opening "M", underneath the heating compartment, from where it is spread over the base, and passes up through some water tubes, or air tubes "N", and on out at the top. The air which passes through the incubator is passed up through the heating tube "C", into the incubating chamber, from where it passes up through the trays, and out at the top, as regulated by the temperature regulator, which is indicated at letter "O". That regulator also regulates the draft of the fire, or the outlet gases, to control the heat through the valve "Q".

Now, to read a little from the specifications,—in fact, I would like to read considerable of this, because this seems to have been quoted many times, as one of the important patents: "In the incubating processes hitherto known with group charging of the various compartments of the incubating apparatus, and simultaneous treatment of the groups of eggs inserted at different times into the incubating apparatus, too little attention has been paid to the maintenance of a uniform temperature in the whole incubating room. In known processes of this kind, the individual groups inserted at different times have been arranged in parallel with respect to the supply of heat medium. Either the individual
387 egg carriers were displaced laterally at given time intervals, in succession, in an incubating room traversed

by an ascending current of hot air, until the whole incubating room had been passed through, or a row of egg carriers to be charged at different times were placed under a hot water boiler, and each egg carrier by itself removed to a suitable distance from the boiler during incubation. In the first case, the self-heat of the egg increasing toward the end of the incubating period is not taken sufficiently into account, while in the latter case, where the hot water boiler arranged at the top of the incubating room, heats the same by radiation, a too rapid fall in temperature takes place toward the bottom, so that not enough steps are allowed for changing the position of the egg during the incubating period. On the other hand, the egg groups inserted into the incubating room at different times, according to the present invention, are always exposed directly to the very same current of hot water, in such a way,"—that is the hot air passes up through the eggs at various stages.

By Mr. Williamson:

Q. "In such a way?"

A. Well, that was my note in there. (continuing) "in such a way that the groups are removed progressively or by stages from the source of heat in the direction of the hot air current, and the individual groups traverse in the end the entire incubating room. In this way, the result is attained,
that the egg group freshly placed in the incubating
388 room are exposed to the full heat of the hot air current, while the older groups, farther advanced in the incubating room, are exposed to the current only after it has given up a part of its heat. The possibility is thus offered of maintaining a uniform temperature in all compartments of the incubating room, while taking into consideration the self-heat developed by the egg in the later stages of incubation, in that the heat abstracted from the air current in the superimposed or adjoining compartment is supplemented by the self-heat of the eggs. In this way, the compartments with older eggs are prevented from exposure to too great heat."

"The devices constructed for the new incubating process,—"

Q. What page is that on?

A. That is the second page,—on page two. (continuing) "—offer the advantage, especially for smaller operations, that while the apparatus is working, fresh groups of eggs can be inserted at given, shorter intervals." That is stage incubation. "The different compartments are appropriate-

ly superimposed, as in this way a good connection with the heating room is made possible, on the one hand, and, on the other hand, good ventilation, therefore effective withdrawal of the gases developed from the hatched eggs."

Now, there is a description that I am not going to omit. I don't think that is clear.

Beginning on page three: "When the apparatus is to be operated, the lowermost compartment is first charged,
389 and after some time the lowermost case is removed from the eggs and placed in the next higher compartment. The eggs could also be simply transferred to the next higher compartment. The lowermost compartment is then charged again. This operation is repeated, so that the individual groups gradually come to reach the uppermost compartment."

That shows the method of charging from the bottom up.

Now, I would like to go to the end, and read the claim which is allowed in this German Patent, or in the Stulik Patent.

Q. On page four?

A. On page four: "1. Incubating process for group charging and simultaneous treatment of groups of eggs inserted at different times into the incubating apparatus, characterized thereby, that the egg groups inserted at different times into the incubating room are directly exposed to the same current of hot air thereby, that the groups of eggs are moved by stages in the direction of the hot air current more and more from the source of heat; while this is taking place, the hot air current, first brushing the eggs freshly laid in the incubating room, and then, in succession, the older groups, transfers to the individual groups so much heat that a uniform temperature prevails in the entire incubating room, when the various degrees of self-heat of the eggs at the same time is taken into consideration."

Now, that, Your Honor, is a patent which describes large incubation, and describes incubation in which the self-
390 heat of the eggs is taken into consideration in the hatching compartment.

The next patent is Number 1,075,747, issued October 14, 1913, to C. W. Zimmer. This represents another incubator for stage incubation, in which the eggs are placed in layers or trays, which are superimposed, but between these trays are feather mats.

391 A. (Continued) Now, to briefly explain the structure, we might refer to sheet number 1, which shows a vertical cross section through the incubating chamber with two layers of eggs in the incubating compartment and one layer down in the hatching compartment. Now, briefly, this structure has the same controls—similar controls to the others. It has temperature control. It has hot water heating device which circulates the water around the jacket in order to heat the incubating chamber. It has the air inlet and outlet, and the point of difference that I want to bring out, the particular point, is the method of hatching the eggs by staged incubation. Now in operation, the first layer of eggs which—set in the operation—I think I will read a little from the patent to show the operation, better to explain it. Quoting from the specifications on page 1, second paragraph, "This invention is an improved incubator which I term a semi-fireless incubator, and by means of which the animal heat of the eggs which after having been partially incubated and by artificially or externally applied heat may be utilized for incubating other eggs, supplied to the incubator chamber from time to time." Now that states the object of the invention. Now quoting from page 2, the second column there, the second paragraph,—

Q. Line 75, do you mean?

A. Line 75: "In the operation of my incubator, and by my improved method of hatching, I introduce a layer of eggs progressively from day to day. On the first day
392 a layer of eggs is placed directly in the bottom of the incubating chamber, after the incubator has been artificially heated and while the heating apparatus is in operation, and a feather mat is placed on said layer. On the second day another layer is placed at the bottom of the incubating chamber, the first layer being placed in one of the trays and disposed on the new layer." That is the old layer—

Q. Just read the quotation.

A. I guess I better read the quotation. The quotation stops here: "And separated therefrom by a feather mat and also covered by another feather mat, I continue this process from day to day, supplying a new layer every day at the bottom of the incubating chamber and raising the other layers, so that the layers are disposed of in the order of their ages, with the oldest eggs on top. I continue this for ten consecutive days. During this period the incubator is artifically heated and is kept at the usual incubating temperature, and I continue this artificial heating for two days longer, or until the twelfth day is reached, and the upper layer of eggs is twelve days old in point of incuba-

tion. By this time incubation has so far progressed in the eggs of the upper layer that there is circulation of blood in the embryos of that layer and the said layer gives off considerable animal heat. At this point in the period of incubation the lamp is extinguished and the incubator allowed
393 to cool gradually, and when it has become partially cooled all the trays containing the eggs are taken out of the incubator and a mat of feathers is placed on the bottom of the incubating chamber. The eggs are now replaced in the incubating chamber in reverse order to the former arrangement. That is to say the oldest eggs in point of incubation are placed in first, at the bottom of the super imposed trays or layers of eggs, the newest eggs being on top. Hence, the eggs in which incubation has progressed so far as to cause them to give out animal heat are below the other eggs, and this animal heat is utilized to maintain the required temperature in the incubating chamber, and to continue the hatching of all of the eggs. The artificial heating may be wholly or partially discontinued or may be progressively reduced from day to day, according to conditions."

That, I think, makes clear the method.

Q. I think you should read the next paragraph also, Professor.

A. "It will be understood that each layer of eggs supports the weight of the eggs in the upper layers, and that the eggs in the bottom layer in which the process of incubation is most advanced, support the weight of all the other eggs. The heat of the hatching eggs causes them to expand and apply pressure to the shells thus tending to disintegrate the shells and this disintegrating process is greatly promoted and facilitated by the weight of the super incumbent layers of eggs, the weight tending to flatten the lower
394 eggs, changing the shape of their shells and hence aiding in their decomposition, and hence rendering them somewhat more brittle."

The Court: You mean to say those lower eggs bear the weight of all those above?

The Witness: That is the description here. The layers of eggs are super imposed and this feather mat in between them.

The Court: I understand, but they hold the weight?

The Witness: Yes—

Q. He puts a support under there so that whole weight don't lay on the eggs. There is a support there. Point it out, Professor.

A. I will go on with this and finish this.

Q. There is a support there.

A. "When the day arrives for the hatching of the lowest layer of eggs, said layer is relieved of the weight of the other layers. To effect this, the other layers are removed; a support is placed in the bottom of the incubator and the layers of eggs are then replaced in the same order as before." My understanding is that—

Q. In the paragraph beginning in line 26, on page 3, reference is made to that support.

A. Quoting then from line 24, page 3: "A suitable support is shown in Figure 1, and comprises a circular form, 32, having a series, say about 6, of supporting legs, 33.
395 The height of this support is such that it forms a space of about an inch above the bottom layer and below the next lowest layer, thereby providing room for the chickens to hatch at the bottom of the incubator." That is the hatching period, you understand. Now that describes, I think, clearly the method of placing these in layers one above the other. It is a progressive or staged incubation. The eggs are moved about, reversed in process and during the process of incubation the heat of the hatching eggs is taken advantage of to a certain extent for the hatching or warming up of the other eggs, depending upon the stage of incubation.

Now next I would like to show hurriedly a few gravity draft incubators.

Mr. Ely: What kind of incubators?

The Witness: Gravity draft or—

Q. Which one?

A. First, United States Patent Number 330,457, issued November 17, 1885, to C. Bassini and A. Hayden.

Q. Just use the last name, Bassini and Hayden.

A. Now in order to describe this incubator I will refer briefly to Figure 5, sheet number 2, which shows a vertical cross-section through the incubator proper. This shows that the—in this particular illustration there are two trays of eggs, one above the other. These eggs are arranged for rolling the eggs by placing them on a stationary screen—no, they are placed on a stationary rack like and the bottom is on a
396 movable screen which is operated from the outside of the incubator. By pulling that support or bottom

screen in and out the eggs are rolled backward and forward to change their position. The incubator is heated by hot water heater which is illustrated by pipes, G, at the bottom and it is also illustrated in figures 3 and 4. It is an ordinary hot water circulating system. The air is let into the incubator through an opening near the bottom on the right hand side of Figure 5, and it is let out as at the top opening in the upper left hand side. It doesn't seem to be shown as opening here, but it is a section further back. That opening is operated by a thermostatic control.

Q. Control, you mean?

A. Control, yes, operated by a thermostatic control which is shown in Figure 2 and sheet 1.

Q. Also Fig. 5?

A. Briefly the thermostat consists of a mercury thermostat which makes electrical contacts due to the expansion or contraction of the mercury and depending upon the one for heat or regulation the thermostat operates the solenoid which is shown in the upper right hand corner of Figure 5, or top, and through that solenoid, operated electrically, the temperature is controlled and the air. Now the water pans which supply the moisture are given here, and shown at g of Figure 4, small g in this case. Figure 4 shows the water pans which are placed in the incubator. Here we have an incu-
397 bator which has air currents circulating up there by gravity. The heat is by the hot water method. The eggs are turned on their trays and the trays are super imposed one above the other. And referring to Figure 2, there are two tiers of trays or two rows of trays on each side of a central part, so it shows a row of trays on either side of the central part.

Now next I would like to refer briefly to patent number 344,474, issued to Campbell, June 29, 1886. This can best be explained in operation by showing sheet number—drawing sheet number 1. This I will describe very briefly. It shows here an incubator which is heated by hot water. It has air, the outlet at the top and inlet. It has water pans which are shown underneath the water coils for supplying moisture. It has double rows, that is two rows of trays, two high. The trays are not shown in here, but the supports for the trays are shown.

Q. How about the control of heat? Is it thermostatic?

A. Thermostatically controlled, yes. The thermostat is shown at the left and it is a specially constructed water bearing thermostat. It doesn't seem necessary to go into it as the thermostat is there.

Now next I would like to refer to United States Patent number 591,870, issued to F. H. Morgan on October 19, 1897. This can best be explained—this is an incubator in many respects similar to the other—by referring to sheet number 1, which is a vertical cross-section of the incubator. In this
398 case there are two layers of egg trays, only one tray on each side, showing the eggs are placed between fixed racks with their small end downward on a movable support. Now that support moves backward and forward to rotate the eggs and change their position from time to time. The heat is supplied in this case by a hot water heater shown at the top of this cut by letter f-1. The heat is controlled by a thermostat shown at the central part between the two egg trays, and that thermostat is operated by a compressed air tank or by the air from a compressed air tank which is shown underneath the incubating chamber at e prime. That is merely a different type of a thermostat which is used on this particular incubator, but it performs the same function. The thermostat in this case operates to let the air through the incubator at the top. The top outlet is controlled, and also to operate the flame of the lamp or heater shown on the right of this section. That is merely a method of thermostatic control. The air is controlled, inlet air comes through the tubes, M prime and M-2, M-1 and M-2, you might say, coming up through the bottom of the incubator and is shown back of this air tank. The valves on top of those tubes are shown as controlled by the thermostat as well as the top opening which is shown in the center of this section. That is the thermostat controls the air and also the lamp.

Now next I would like to refer, just briefly, in this case, very briefly, to patent number 691,837 issued January 28,
399 1902, to B. S. Bell. This illustrates an incubator which is large enough for a person to walk in. It has a single column of trays heated by a heater which is shown as a lamp in this case with air inlets at the bottom and thermostatically controlled air outlets at the top. The water supplied is shown by pan 20 in figures 2 and 3, which also show the sections of the incubator. The main point here is that here is an incubator with trays stacked in tiers, several trays high, which is heated, which has water for humidity, and which has a temperature control, and which has air supply.

Q. And a big corridor to go in?

A. And a big corridor to go in which is—in which to work, a person can work.

Q. How many trays in the tiers? How many trays shown in the cut in the tiers super imposed? A. Eight.

Q. Thanks.

A. Next I would like to refer to Patent Number 1,160,793, issued November 16, 1915, to Van Keuren. To describe the operation of this incubator, the structure of it briefly, refer to drawing, Figure 2, which is a vertical cross section of the incubator shown in full view in Figure 1. This is a small type of incubator. It has a central column in here or opening. On each side of that are trays, two trays in this case and the incubator is heated by a heater which is shown on the side of Figure 1, or shown in detail, Figures 5 and 6. That
400 shows the—Figure 5, for instance, is a section, vertical section, longitudinally through the central corridor showing the circulation of the air for heating, and also the opening through which the air for ventilation passes. It passes, briefly, up through the opening 25, and inside of the tube, 26, to the central part of the incubator, the central part of the incubator. Now—

The Court: This is a tube?

The Witness: This is a tube. This is a—

Q. Speak up so the reporter can get it.

A. The hot gases from the lamp or heating element pass up from the tube, which is marked 18, which is inside of the heating chamber and that tube, 18, is really the heater which heats the air going into the incubator. That is the air is heated partially as it passes in at 25, and the remainder around that tube 18. Now referring to Figure 2, the circulation of air through the incubator proper is as follows: We have carried the air up into the central corridor around the heating chamber from the other cut or figure. From here it passes downward under the partitions there on each side of the central compartment, as illustrated by arrows 8. The warm air passes downward under there and up to the bottom part of the trays. From there is passes to the ends of the trays, either end and up by the end of the trays over the baffle plate which is indicated by 10.

The Court: It just circulates up through there?

401 The Witness: It has to pass around these.

These are solid bottom trays, so it passes around the ends of the trays in this case.

Q. It passes through the trays too, don't it?

A. It passes around them at the end of the trays.

The Court: You mean this end or around this end?

The Witness: No. If you refer to Figure 3 it passes to the two ends and up through the space at the end of the trays and around the trays from here. And from the top of the trays it passes around the baffle 10.

Q. Baffle plate you better say.

A. Baffle plate 10, into the central corridor, or rather it is not corridor, central opening which I believe is 40.

Q. You mean the one at the top?

A. The one at the top, yes.

Q. Is it thermostatically controlled?

A. This incubator has the water pan. I won't take the time—I can't find the thermostat right now. It seems to me he specifies in the specifications that any type may be used. At this moment I don't see it.

Q. How does the air circulate in that Van Keuren incubator, this patent number 1,160,793, compared with the air circulation in the Smith machine, in the machine of the Smith patent.

A. Well, the air circulates in this machine, comes down, as I have explained, underneath those partitions on each side or portion and up to and around the trays and up to the
402 top of the incubator. That is it passes down and up through the trays.

Q. And the corridor is partitioned off from the tiers of trays?

A. Yes, the corridor is partitioned off. It can't pass directly through the partition.

Q. Go ahead.

A. Now next I would like to refer to—well, I might call attention first to the fact that the patents both—all three of these I have referred to, I believe, Bassini, Morgan and Van Keuren, also circulate in this same method that I have just explained, through the corridor and up through the trays. I don't know that I called your attention to that.

Next I would like to refer to patent number 916,454, issued March 30, 1909, to Koons. Now in this, to get the general structure, refer to Figure 1, which is a vertical cross-section through the machine. Now in this vertical section at the top there is a hatching compartment shown at 5. Immediately below that is a chicken drying compartment, another compartment shown at 10. Immediately below that is a water compartment which I believe is shown at 90, and immediately below the water compartment there is a heating device. Now I will explain the operation of the heating device—or immediately below the heating device is another tray or drawer there for the young chicks. Now the heating device can

probably best be explained by referring to Figure 7.
403 The heating device consists, referring to that view, of a lamp or heater, 16, the gases from which pass up through the chimney 17 into the space 12. From the space 12 they pass to the opposite side of the incubating chamber and turn back in a parallel space, 13, which is best shown on—in figures 2 and 3. In Figure 3, which is a cross-sectional view, perpendicular to the floor of the heated—hot gases next to the lower compartment, the cross-section of 12, is shown in the right, and the cross-section of 13, the return pipe is shown—or 12 is shown at the left and the cross-section is the return pipe, 13, at the right. That same arrangement too, is shown in Figure 5. The pipe, 12, passes in that figure from right to left, where it communicates with 13, back through 13 to the opening, 18. Now from opening, which is from the return pipe, 13, if we refer to Figure 1, the hot gases pass up through the chamber, I believe marked 21, marked 21, and out at the top. Now that represents the circulation of the exhaust gases from the lamp or the products of combustion from the lamps, of the gases through the incubator and out and it doesn't come in contact at all with the air. Now the air circulation through the incubator—

Q. You better state how the air is heated first.

A. The air which circulates through the incubator comes in at opening, 7, figure 1.

Q. Where is that, bottom or top?

A. It is near the bottom by the lamp.

404 Q. Oh, yes.

A. From here the air passes around the heating pipes, 12 and 13, and up into the space over the hatching and around the hatching trays through the pipe in the rear of Figure 1, marked 8. After passing into the hatching and other chambers there, the chick drying chamber, it is drawn across by—or to the right hand side of the incubator as looked at in Figure 1 to the outlet pipes marked 54.

Q. You mean through the outlet pipes marked Figure 54?

A. Through the outlet pipes marked 54. Now these outlet pipes deliver into the chamber around the—with the hot gas—

Q. Marked 22, isn't it, Fig. 1?

A. Yes, that is marked 20.

Q. 22, isn't it, in Fig. 1?

A. No, 22, I think that represents the valves that operate the main. At any rate it comes right into this chamber here.

Q. It is 20. You are right.

A. 20, and comes up in that heated chamber, passes up and that gravity circulation there will depend upon the height

of the column of warm air there. Now the regulation of temperature is by a thermostatic control which in Figure 1 is shown, that is the thermostatic element in Figure 1 is shown as 34. The thermostatic element then operates a control over the chimney of the lamp which opens up that valve, 22, or closes it, depending upon whether heat is required
405 in the incubator or whether it is to exhaust directly without going through the incubator. I think I have called attention to the water pan at the very—

Q. But you have not yet described the operation and I call your particular attention to the part of the specification that begins about line 29 on page 2, and continues through to line 30, line 29 on page 3 of the specification where he talks about forced draft.

The Court: That is, he forces it by heat.

Mr. Williamson: Yes, by the height of your chimney sucking it up.

The Court: No fan or any other contrivance?

Mr. Williamson: No fan. No fan.

Q. Please point that out to the Court.
A. I pointed that out, I think.

Mr. Williamson: He has even got claims to it.

Q. Read a portion of it so as to make clear to him.

The Court: The apparatus itself shows that without any reading.

Mr. Williamson: Oh, you understand, do you? But he puts great emphasis on the forced draft. The height of your stack, you can get any suction you please. You understand that.

The Witness: Yes, I think I have made it clear, Your Honor. The stack, you could get anything from that depending upon the height of the stack.

406 Q. All right. Go on then.
A. Now, as to heating, moistening, fresh air circulation and thermostatic control, many of those patents show that, practically all of them.
Q. That is in this patent?
A. Show all of those elements. I don't need to go into that. Now, I would like to—
Q. Go ahead with the next one.

407 A. Now, I would like to call attention to the patent, 426,321, issued April 22, 1890, to Proctor & Knowles.

Q. Proctor & Knowles, is it?

A. Proctor & Knowles. This and the next three or four I am calling attention to show the closely allied art. These are not incubators, however, they are very closely allied in the operating method. Now, to explain the operation of this, without going into all the modifications, I would refer to Figure 8, sheet number 2, which is the lower figure here, and it shows one of the many modifications of the structure. In this form there are two chambers shown side by side, and I will take the one on the left to show the air circulation at the center of the chamber,—

The Court: At the top?

The Witness: At the top center, and is a fan C, which is operated through a shaft D, which extends to the bottom,—I think that is a belt drive, but, that is immaterial. It is operated by that shaft. On the sides of the large chamber there are heating coils B, and between the fan and the heating coils there is a shield, or a drop-shield indicated at G. Now, that shield extends around to the fan and when in operation the fan pulls the air downward, as shown here, into the chamber beneath, in which the material for drying may be placed, and up through the heating coils and the air circulates, the major part of it, back to the fan. There is an opening shown on the side of that H for the intake of new air and

408 the discharge at the bottom, shown as I, for the discharge of the air taken off,—any proportion of it may be taken in and out,—they may be regulated to take in a part of the air as new air, and discharge a part at the bottom. Now, in this circulation we have a very similar circulation to that shown in the Smith patent. This is a drying machine, but we have a downward circulation of air through a central corridor in this case, up through the heating coils and back to the fan again, with provision for circulating all of the air, or admitting partly fresh air.

Q. Professor, how does the air get back into the eye of the fan? You may have to refer to some of the earlier views there to show that, where these partitions, as I understand it, between the two sections of that chamber, are perforated?

A. I think that is clearer here.

Q. Make it clear to the Court.

A. The space above the heating coil is a perforated space to let the air through from the lower to the upper chambers.

Q. You mean as a perforated or graded floor?

A. Yes, to let the air through. It was designed to be placed in some modifications between the floor,—not that,—it is designed in the large installation to be placed in two rooms, one above the other.

Q. How about the question of the size and capacity of this drying machine disclosed in the patent you now have under consideration?

409 A. This is a large size, designed to be placed in between rooms or floors.

Q. What is the purpose of the floor?

A. All sorts of drying purposes.

Mr. Williamson: This patent was never before in Court, so far as I know. It is a new one.

Q. Go on.

A. Next I want to refer to Patent Number 553,723, dated January 28, 1896, to Proctor. This relates to an apparatus for ordering or conditioning tobacco. Now, to explain this best, we can refer to Figure 1, which is a vertical cross-section through the machine, and in this cross-section it shows a central corridor with a fan above it, and it shows a compartment on each side. It shows in those compartment racks, showing tobacco hung on the racks and on trucks, or rollers, or, in other words, those racks may be pulled in and out on the trucks. It is a large size machine, evidently, from this drawing. That is a truck, and the method of rolling in and out is best shown by sheet number 3. There is a large truck in there with the racks on, which are rolled in and out and loaded outside of the apparatus.

Q. Outside of the cabinet?

A. Yes. The air circulation in this is as follows: The air from the fan,—

Q. Look at Figure 2. There is more than one fan, is there not?

410 A. Yes. I will explain that. Referring to sheet 2, that is a vertical top section.

Q. A horizontal section?

A. It has a horizontal section showing,—

The Court: Placing the fan above the corridor.

The Witness: Placing the fan above the corridor and it shows the corridor and a space for tobacco or space for the racks on each side. The air is circulated by the fan down through the corridors to the bottom, where it passes out under the openings of partitions of the,—

Mr. Williamson: You mean through?

The Witness: Yes, it passes out.

The Court: Are there partitions on the side of the corridor?

The Witness: Yes.

The Court: It passes under it?

The Witness: It passes down to the partition into the side compartments. From here, it passes up through these side compartments up through the top, which is illustrated there in the open work, or slats E-2 and E-3, from where it is drawn back to the center compartment, and again re-circulated by the fan. Now, in this machine the circulation in here is almost identical with that in the Smith incubator. The circulation of the air is down through the corridor out under the side of the partition, up through the compartments on either side.

411 Q. You mean the bottom of the partition, instead of the side?

A. Yes,—out under the bottoms of the partitions to the side, up through the compartments on either side, and back again to the fan. Also there is a device for adding humidity or moisture to the air. That humidifying device is shown in sheet 3,—sheet 1.

Q. Figure 2, isn't it?

A. It is shown in sheet 1, as G, with the exponent 1 to 3.

Q. It is also shown in Figure 2, isn't it?

A. It is also shown in Figure 2 by the same letters. In this apparatus the partitions in here promote the same function as the curtains do in the Smith incubator. They draw the air downward and give us a positive circulation in a positive direction. They are simply partitions, instead of curtains.

Q. State whether or not the air in the machine, by this Proctor patent, moves down in columns through the corridor, or not? A. They do.

Q. It is moved in columns up through the space where the tobacco is hung? A. Yes.

The Court: The tobacco is just hung down there and it moves up through it?

The Witness: Yes.

The Court: And the corridor is an open space and it
412 goes down through the corridor?

The Witness: Yes.

Q. Is there any difference whatever between the air circulation in the machine of this Proctor patent, and the circulation in the Smith machine?

A. No sir, except there may be a little difference in the details of construction, as built.

Q. I am talking about the methods.

A. The methods are the same. The difference in the air, I might say, is the supply of the new air,—in the incubator you take in a little new air, and the circulation is the same, but it is not necessary to take in new air.

Q. Go on.

A. Next I would like to call attention to Patent 1,010,809, issued December 5, 1911, to Schmidt & Shutterle, and this is an apparatus for drying macaroni and light bakery products. The method of operation and the description of the,—

Q. Describe the structure enough to make it clear before you talk about the operation.

A. All right. The description of the apparatus can best be shown by referring to Figure 2, on Sheet number 2. Now, in this figure there is a drying compartment,—to begin with, it has a large size casing, or housing. In the lower right hand side there is a rack of trays, which is placed on rollers, as shown there, to be taken in and out. Now, the material, of course, is dried and is placed in here on a tray or
413 rack. There is a fan just at the left of those racks, shown at B, which is operated from the outside by a shaft, or pulley, indicated at 4, and back of the fan there is a series of steam coils E, pipes, but they are shown in sectional view here of course, for heating the air as required. At the top of the fan there is a valve, or flap, you might call it, 12, which goes clear across the machine and hinged at the back so that it can be opened and closed. Above that in the casing, the opening shown at 9, figure,—

Q. Figures 1 and 2

A. There are two of them shown in Figure 1, and they are also shown in the sectional view in Figure 2.

Q. And Figure 4.

A. Now, at the rear in the lower part is an opening 7 for an inlet of air; that is for a change of air in the drier. This can be regulated to take in outside air, or they can be regulated so that all of the air is circulated within the chamber. Now, in addition to that, there is a humidifying apparatus shown at 15, Figure 2, right back of the fan.

Q. You mean outlet of the fan?

A. At the left of the fan. That same humidifier or spray, is shown in Figure 4 by 15 at the central part. Figure 4 is

the section that is back of the fan. Now, the circulation of air in this is caused by the fan.

Q. How about the pitch of the blades, before you come to that,—the pitch of the blades on the fan?

414 A. The blades of this fan are pitched forward, as in a perpendicular fan, to propel the air passing through it forward and the air is supplied from the rear of it or left of it, in this view and propelled forward into the drying compartments.

Q. What is that part marked 10, shown best in Figure 2 and Figure 4 of the drawings of that patent?

A. It is a top of the partition, or the false partition to draw the air forward. It is a partition or ceiling above the drying compartment.

Q. Go ahead.

415 A. To describe the circulation of air in the machine, the fan is rotated to propel the air from the left of the fan, in this case, to the front or right of it, through the fan, and the air is driven through the drying compartments, through the trays indicated by R, to the right wall of the drier; from here it is forced up through the opening between the ceiling 10 and the right wall to the space above the ceiling, from where it circulates back to the left, and, as the valve 12 is now set, it circulates back to the rear of the machine. It circulates back to the rear of the machine, pulled through the heating coil E and past the humidifier, back through the fan; or, in other words, the air is recirculated by the fan through the drying compartment up into the false ceiling, which carries it back to the rear, through the heating coil, and the greater part of it is re-circulated. The inlet opening 7 and the outlet opening 9 may be controlled to let new air in, and a part of the mixture out; that is, all of the new air will be circulated, but, new air may be added as needed. If the valve or cover 12 is raised up to the dotted position, shown in Figure 2, then, in that position a part of the air will be re-circulated over the heating coil and a part of it will be re-circulated in front of the heating coil, or, in other words, the temperature will be controlled by the regulation of the valve. You can either heat all of it or part of it, or none of it. The valve can be regulated to control the heat. Now, in this apparatus, we have an apparatus which has got all of the

416 elements of an incubator. We have got a chamber and heating control; we have got humidity; we have got new air supply and old air provided for; we have got in the compartment racks or trays which could be used for egg trays, or a space which could be provided with suitable egg

trays. If, in that space, suitable egg trays were provided, this machine has all the elements for hatching, just the same as in the other incubators. We have got temperature, humidity and air circulation and new air,—the requirement would be suitable egg trays.

Q. Is the heat controlled?

A. The heat is controlled by the flap 12, and further, it can be controlled by the,—the heat can be regulated by the amount of steam or water which is admitted to the coils, as well as by the flap, or valve 12 in the incubator.

Q. Now, state whether or not, in your opinion, the machine disclosed in that patent that you have just been discussing, to-wit, the Schmidt and Schutterle Patent, 1,010,809, of December 5, 1911, could be used just as it is there disclosed, for hatching eggs.

Mr. Ely: I object to that question.

Mr. Williamson: It is a perfectly proper question. He has made a close study of all these patents, and he has read all this testimony of Mr. Snow and Mr. Taggart, and all those people, and he knows enough about incubators to answer that question, and he is a high class mechanical engineer,
417 and all I am asking for is his opinion, and I think he has a right to show that.

Mr. Ely: I don't think he is qualified.

The Court: He may give his opinion.

Q. Go ahead. A. Yes.

Q. You said you can?

A. I answered your question "Yes."

Q. Go on.

A. Next, I would like to refer to Patent 1,137,752, dated May 4, 1915, to Goldstein. I will explain the apparatus by referring to Figure 1. This consists of an apparatus for artificially aging cigars. It consists, as shown in this figure, of an outer casing 9, and an inner casing 10. The inner casing, front walls, the ceiling and floor extend clear back to the rear wall of the casing 9.

Q. Explain to the Judge the view, so he will understand it.

A. The view I am referring to is a vertical sectional view down through the housing. In the ceiling of the inner casing, shown as 10, and the floor of the inner casing, also shown as 10, are perforations or openings for admitting air to circulate through the casings. These perforations are also shown in the partially sectional view of Figure 2. In this, there is

a heating coil 11, supplied by heat from the heater 14. That is shown at the right of the Figure 1, and also in the lower part of Figure 3. Above this, there is a fan which cir-
418 culates the air, as I will explain later, and above the fan is a humidifying apparatus, which consists of a tank of water 13, and a heating element,—electric heating element 17. The humidity supplied by heating the water in the tank 13, that is by means of this electric heating element, and the heating element is controlled by apparatus marked 21, or the humidistat. That operates to throw the heat on and off from the heating element to control the humidity in the inner chamber. The heat, which is supplied to the coil 11, is controlled by the thermostat marked 20 in the inner casing, which operates a solenoid control valve 25 from the heating coil, or, in other words, the thermostat 20 controls the heat by controlling the water to the heating pipe. The air circulation is as follows: The fan 12 drives the air upward through the chamber, into the space between the ceilings of the outer and inner boxes. From there it is filtered down through the inner cabinet, out through the lower opening 10, in the lower part or floor of the inner cabinet space. It comes back into the space and then it circulates up through the heating coil 11, and re-circulates in the chamber. Here we have re-circulated air,—air re-circulating in the chamber with humidity control and temperature control, which is, in this case, for the purpose of conditioning cigars.

Q. The air is circulated by a fan, is it not?

A. By a fan,—positive circulation. Next, I would like to refer briefly to Patent Number 745458, dated Decem-
419 ber 1, 1903, to Perkins. Now, I will go over this very briefly. It illustrates an electric incubator. The incubator is in sections 10 in Figure 1, which shows a vertical section with one egg tray. The feature of this egg tray is that it tilts back and forth, and the eggs are placed in troughs which are shown in Figure 2, and, as the tray tips, in either direction, the eggs will roll down this trough, depending upon the clearance space. The trough is perforated underneath, and it is a particular means for controlling or for turning the eggs during the process of incubation, and it illustrates an electrically heated incubator, which has also electrical control on it.

Q. I call your attention to the elements E Prime on Figure 1 of the drawing, and ask you to state what they are. Aren't those solenoids?

A. E and E Prime are both solenoids and those solenoids are used for the purpose of tilting the tray back and forth.

Q. It tilts the trays? A. Yes.

Q. The eggs are not changed by rolling, but by tilting the trays?

A. The eggs are changed by tilting the trays, and the eggs roll,—there is a little space at the end, and they actually roll down there, as I understand the facts in this case.

Q. All right.

A. Now, next I want to say something as to the art of heating and ventilating of houses and buildings and homes.

420 Mr. Ely: That is objected to as improper.

Mr. Williamson: It is very highly pertinent. There is no difference between heating and ventilating an incubator than there is in heating and ventilating a room. Judge Hickenlooper, in a case so stated in his decision. It is a heating and ventilating problem pure and simple.

The Court: I think I will hear it.

A. I have not got the reference on that.

Q. Which one do you want?

A. I want Knight's Dictionary reference.

Q. Do you want the patent or the photostats? Here is the book.

A. Well, I will explain: Briefly, the reference, as illustrated in Knight's Dictionary, on page 2705.

Q. 2704 and 2705.

A. And the date is 1884, the dictionary.

Q. Volume three?

A. Volume three. Now, referring to this figure 6960, it is a vertical cross section through the Senate Wing, United States Capitol, showing the pressure and exhaust of the ventilating apparatus. Now, in general, I might say the forced air circulates through this chamber, and the new air is drawn in it outside the opening A,—through an opening A in the outside wall, at the lower right of the figure. It is drawn in by a fan, and it is then passed through steam heating coils for temperature regulation, into a chamber where
421 moisture is added, or humidity, up through a duct, or flue, marked C, into a space or air chamber under the Senate floor. From here it passes up through openings in the Senate floor, and is filtered through the room and passes out at the top into the upper space, from where it is exhausted or pulled down a shaft or column D, by an exhaust fan shown at the left, and discharged out through the column E to the outside, or, in other words, it is a ventilating system that was used at that time in which air is pulled through

a fan and forced through coils and humidified, and into the chamber, and exhausted by positive circulation out of the chamber.

(Recess taken until two o'clock p. m., November 22, 1932.)

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422 (Professor Frank B. Rowley resumes the stand.)

(Afternoon Session, November 22, 1932, 2 o'clock P. M.)

Direct Examination (Continued).

By Mr. Williamson:

Q. Proceed in your own way, in the explanation of the patents, unless you are through, and publications.

A. I would like to refer to Patent Number 260,223, issued to Johnson, March 29, 1887, showing an electrical apparatus for heating and cooling a building. In explaining the apparatus and method as shown here I will refer to Figure 1 of sheet 1, which shows a vertical cross-section through a building showing three floors and a basement, or at least a lower floor. The apparatus consists of the housing in the lower compartment or floor, A, with heaters in it, and pipes or air ducts, marked C and D, leading up through the walls, to the rooms in the upper two floors. Pipe C leads to the second floor, and pipe D to the first floor, which are considered the lower room or basement. Leading into chamber A is a pipe from the outside marked B. In the upper ends of the two pipes C and D, are electrical driven fans, marked G, and driven by motors marked H. These motors are controlled by thermostats which are shown in either room as KI. Those thermostats operate to reverse the direction of the fan motor. That is they reverse the motor so that the fan, G, may be operated in either direction. Now, if operated in one direction, the motor—I mean the fan, G, is so driven as to drive
423 the air out into the room, therefore draws the air up through the pipe, C or D, as the case might be. The air is drawn out of chamber A and if it is blown into the room it is then discharged out of outlet L in the upper part shown here. If both pipes or all pipes leading from the compartment A happen to be drawing air at the same time, then the air is supplied to the compartment A through the pipe B shown in the lower left hand corner running to the outside. Now, if the pipes leading from the chamber A happen to be so operated or controlled, the motor so controlled, that half of them are taking the air out of the chamber and

half are putting air into the chamber, A, then the pipe, B, is inoperative. That is, the air is put in in one side and out the other. And in case the pipes, or fans rather, G, are drawing air out of the rooms, both of them pulling it into the chamber—pushing it into the chamber, A, it is then discharged through the pipe B to the outside and drawn in in that case through the dampers or controlled openings, L, in the left wall of this section. This then is a means of controlling the air supply to the rooms, either in or out, by electrical fans which are reversible.

Next I would like to refer to Patent Number 843,909, February 12, 1907, Peters and Hungerford. Referring to—rather it is the only figure, referring to the figure in this patent we have there a vertical cross-section down through the complete room and the apparatus shown below the room for heating and cooling and controlling the humidity
424 of the air in the room. Now, first explaining the apparatus on the lower right hand side—lower right hand corner, there is a fan which draws air in either from the outside, outside air, as shown by the damper in inlet marked 13 at the right, or it draws air in from the other side through the damper in inlet marked 12. That is this fan may get the air supply through either of those lines. The air is discharged from the fan to the left where it is either passed through the cooling coils which are marked 18 or rather 18-A, I believe, or it is by-passed under those cooling coils through the pipe, 26, continuing on to the left. I will explain those in just a minute, how they operate.

The Court: Through the pipe 26?

The Witness: Through the pipe 26, that is right. It either goes up here or around there.

The Court: Oh, yes. It comes in through here.

The Witness Yes, it comes in through here. After it leaves the cooling coils or the by-pass around the cooling coils, it passes to the left through the connection on pipe 19. From there it passes on, either through the heating coils shown as 20-A in housing 20, or else it passes under the heating coils and continues on through the pipe 27, into the pipe, vertical pipe 22. That is the air goes from this pipe 19, either one of those circuits, one or the other, and that depends on the call for cooling or heating.

The Court: It may shut off or—

425 The Witness: Yes, it may go through either one of them. In other words that is a—

The Court: Controlled there one way or the other.

The Witness: Yes, what is required, heat or cold. I will explain that. The air passes up the pipe 22, into the pipe over the room where it branches out, as shown here, into branch outlets 23, 24 and 25. From those outlets it is delivered to the top part of the room which represents an ordinary living room or an occupied space. That is this space confined here represents an ordinary room. From these top outlets the air is delivered downward in the room and passes out, either through the registers which are marked 49, 50 and 51, and delivered into the return air pipe, 11. From 11 it is drawn back through the damper control, 12, and into the fan. Now in that cycle the air is recirculated through the fan. Then it is either cooled or by-passed—the cooler may be used, or by-passed. It is then passed through the heater, which may be either used or by-passed; brought into the top of the room; brought down through those outlet registers, and back to the fan in a re-circulating manner. Now there are thermostatic controls here which operate the heating and cooling coils, depending upon the requirements. To begin with there are two thermostats,—yes, two thermostats, one marked 35 and the other marked 36. There are two humidistats, one marked 37 and the other 38. The
426 thermostat 35 and the humidistat 37 operate together to control the by-pass around the cooling coil. That is if the air becomes too hot it is passed through the cooling coils and also, if it becomes too moist, too much moisture in it, it is passed through the cooling coils. In other words the cooling coils act either for cooling the air or for de-humidifying it, controlling the humidity downward.

The Court: This is just one of many examples of cases of instances where apparatuses are made for conveying hot air and forcing it to the fans and controlling it by thermostats and humidifiers and forcing it through passages and heating rooms and so forth, isn't it?

The Witness: Yes, this is an exceptionally good illustration of full air condition controlling apparatus as shown in this patent. It shows cooling, heating, humidification and de-humidification, or complete air conditioning. And the the point is that the air within that room is competely controlled, part of it can be recirculated, or all of it.

The Court: By this apparatus.

The Witness: By this apparatus, and part of it can be taken from the outside by this apparatus.

The Court: That is nothing very new, is it?

The Witness: Oh, that is very old.

The Court: This method of doing it is patented, I suppose?

The Witness: This has run out. This is an old
427 patent, I presume.

The Court: Yes, it is.

The Witness: But I merely wanted to show Your Honor there is nothing new in this process here. It is extremely old, and in this house in here in that room you could place eggs—

The Court: Of course you wouldn't have to spend much effort to show me this isn't new. There are so many different things I know about myself.

Q. State whether or not this very room shown in this patent you have just been talking about, 843,909, could be used as an incubator?

A. Yes, kept at the same temperature as an incubator.

Q. In your judgment. Go ahead with the next. I might ask you this question: How do these disclosures of heating the room and ventilating and air conditioning compare with your own experience on that subject?

A. These are common practices. This is the common method.

Q. Go ahead.

A. Now the next, I would like to refer to some publications here, which have been introduced, I believe.

Q. Photostats have been introduced.

A. Photostats of these publications, in order to show that the use of fans in incubators is not new.

The Court: Well, that wouldn't be new. They are old generally in the art.

428 The Witness: In the art, very old.

The Court: But they have been applied to incubators?

The Witness: Yes.

Mr. Williamson: That is just what these publications show and what Mr. Smith's testimony shows, it dates over

two years before he applied for the patent. That is what we are coming to.

The Court: It wouldn't take very much to convince me of that, that is, that that method of operating, of controlling the air by fans and by thermostats, is nothing new.

Mr. Williamson: He used it himself at a date over two years in the same kind of a machine, except it didn't have curtains, and here are two publications that relate to it, but I am relying on the publications themselves that describe such and such a thing.

The Court: I don't suppose they claim here that that is anything new, but they are claiming, I suppose, a combination of all the things.

Mr. Williamson: On the contrary that is just what they are claiming. They are asking you to give them the benefit of a claim that is broad enough to cover any kind of an incubator with it, with a fan which would circulate the air. They did that in all these prior suits.

The Court: If they are doing that, it is pretty broad.

429 Mr. Williamson: That is what they are trying to do, and that is what they did in every other suit that has gone up to the Circuit Court of Appeals.

The Court: My only object in speaking was that it seemed so plain and so simple that hot air can be controlled by fans and sent to various passages; that it can be controlled by humidifiers and can be conditioned by humidifiers.

Mr. Williamson: This is the most important piece of proof that we have got in our case, what Mr. Smith said about it. I mean his own usage and difference, to control the meaning to be according to those claims.

The Court: My only object in speaking was I didn't want you to think I would have to sit here for very long without knowing that the use of fans in controlling air isn't new.

Mr. Williamson: I am very glad you spoke about it.

The Witness: Your Honor, I will make it as short as I can. I am not gonig into Smith's testimony because that is in the record.

Q. Speak a little louder. I can't hear you.

A. I would like to refer briefly to these two articles or these two publications, of which I have photostats, and read, as rapidly as I can, in order to explain the apparatus as set forth and as I understood Smith's testimony and compare it with the present Smith incubator.

Q. He admitted those publications.

430 A. What is that?

Q. He admitted those publications and those articles.

A. Yes.

Q. Read from the earliest one first.

A. I will read first from the Sunday Plain Dealer, February 23, 1913, Page 5. "One of the largest egg incubators in the country has been built in an old church building at 7918 Madison Av. N. W. by S. B. Smith, and several hundred thousand eggs will be hatched in it between this time and July. The capacity of the incubator is 100,000 eggs. It will be kept filled continuously until the latter part of July, and it is estimated that about 60,000 little chicks, or about 60 per cent of the eggs put in, will be hatched every three weeks.

"The chickens will be disposed of in large and small quantities when they are a day old and, it is said, some of the large department stores in Cleveland will sell them in dozen lots.

"Before building the immense hatchery Smith, who is a chicken raiser of wide experience, came to Cleveland and looked over the field. As the result of his investigation he says that he can place the entire output in this city or its immediate suburbs. He believes that Cleveland is the best chicken city in the state.

"The big incubator is built with three compartments. Each compartment will hold 33,300 eggs. One compartment was filled last week. Another will be filled this
431 week and the third will be filled next week, and at the end of that time the first compartment will have hatched its eggs and will be ready for filling again."

The Court: Right there. Are they going to put 33,000 eggs in in one week?

The Witness: In each compartment.

The Court: In each compartment?

The Witness: Oh yes.

The Court: They couldn't do that in this machine according to this testimony.

The Witness: They wouldn't hatch them—

Mr. Ely: Not according to the patented process, you don't put them all in in one week.

Mr. Williamson: You don't put them in all at once.

The Witness: "In this way, after the first three weeks there will be about 19,800 chickens put upon the market every week.

"The eggs are placed in the compartments in small crates swung on wires from wooden spools fastened to the ceiling. A screen is placed over each crate, holding the eggs firm, and then, by an automatic arrangement, the crates will be turned over twice a day the first week, four times a day the second week and six times a day the third week.

"The compartments are kept at an even temperature of
103 degrees. Coils of hot water pipes are laid on
432 the floor of the compartment, and an electric fan attached to the ceiling throws a current of air straight down to the floor, where the air comes in contact with the hot water pipes, is heated and circulates upward through the egg crates on each side." That is exactly the same—

Q. Go ahead. Read on.

A. "A thermostat is placed in each compartment and the temperature is kept even by this means. In addition to this provision there is a thermostat placed on the hot water heater, as shown in the smaller of the illustrations, and this causes the water to cool off or heat up to meet the changes in the temperature of the outside air.

"Smith's average of 60 per cent. successful hatching is a high average, but it was maintained last year by him with a 75,000-egg incubator which he operated in Attica, Ohio.

"All the eggs which he hatches come from hens which he has bred. There are about 9,000 hens of his farmed out to chicken raisers in the neighborhood of Attica and the eggs are shipped to Cleveland every Saturday.

"The incubator will be open to public inspection at all times, and a special device for illustrating the growth of the chicken in the egg has been arranged, so that the little chick can be seen through the shell."

That is the publication describing it.

Q. That is the earliest paper. What is the date of
433 that paper?

The Court: February 23, 1913.

Q. Now read the other one, about a year later. State the title of the article.

A. Now I read from the Cleveland Leader, Sunday, February 22, 1914.

Q. Title of the article?

A. The headline of the article, "Cleveland boasts largest hatchery. Plant operated by S. B. Smith has a capacity for 120,000 eggs at one time.

"Although not much mention has been made of the fact, Cleveland is the home of the largest chicken hatchery in the world, the only possible competitors being Egyptian hatcheries. S. B. Smith, formerly of Attica, O., is the proprietor of the Cleveland hatchery which was put into operation last year.

"The plant is located in the old German Lutheran Church at 7918 Madison avenue, and has a capacity of 120,000 eggs at a time. Last year Mr. Smith sold the larger part of his output in the city and the rest in Chicago, but this coming season he expects to market all of his chicks in this city.

"The plant is not only the largest in the world but is also the only one in existence operating on the same system, the system being the result of experiments by Mr. Smith covering a number of years. Other experts have tried
434 out plants along similar lines, especially Milo M. Hastings, a noted poultry expert and formerly with the United States Department of Agriculture, but Mr. Smith has been the only man to devise a practical plant along the same lines. In the plant here, the universal temperature system is followed, every cubic inch of air in the hatching chambers being of the same temperature. There are four hatching compartments, each having a capacity of 30,000 eggs or chicks. The eggs are placed in enclosed trays, suspended from the ceiling and pivoted at each end, allowing the trays to be turned three times a day. When the compartments are filled, one attendant can turn all of the trays in about one hour. Because of the method used there is no breakage of eggs in the turning process.

"Heated by Water and Steam.

"The entire plant is heated by hot water, but the hatching compartments themselves are heated by steam, coils being arranged about the walls near the floor. A fan is suspended from the center of the ceiling, driving a shaft of air to the floor through the center aisle and the air, passing over the heating coils, works back up through the trays. So perfect

is the distribution of heat that the temperature of any part of the compartment will not vary one-half of a degree from any other part. And while the eggs are thus exposed to a moving atmosphere, there is no draft to reach any of them.

"The temperature is automatically regulated by
435 seven thermostats. One master thermostat, operated by steam that burns the coal and keeps an even steam pressure, is the main factor, but there are, in addition, two thermostats outside of the compartments and four inside, one in each compartment. The two external thermostats regulate the outside temperature. The instruments on the interior of the compartments seldom are called upon for work, but serve to act as a check on the master instrument and the exterior thermostats.

"Moisture is Regulated.

"The most important factor in hatching eggs is the regulation of the amount of moisture in the compartment, and this is regulated by humidistats of special design originated by Mr. Smith. These are similar in a degree to those used in large buildings. No other system has ever taken care of the problem to any successful degree.

"The eggs, after being placed in the hatching compartments, are kept there for a period of twenty-one days, although this period can be varied to a certain extent. Three days before hatching time the trays are raised from the eggs so as to give room for the young chicks to walk about after hatching. The chicks are kept in the trays for twenty-four hours after hatching and are then placed in large brooder until sold.

"One of the features of the system is the fact that the exact temperature of the embryo can be told at any time, and the plant is so operated that the temperature of the
436 embryo is kept constant.

"The plant was placed in operation a year ago and Mr. Smith has already built up a large patronage for his chicks. On account of the decreased cost of production the chicks can be sold at prices less than has been asked in the past. The first eggs were placed in the hatchery last Friday and the first chicks will be hatched in three weeks. Mr. Smith is glad to show the plant and its method of operation to visitors at any time."

Q. Now, Professor Rowley, were you present during the examination of the plaintiff, Mr. Samuel B. Smith?

A. I was.

Q. Have you read his testimony as transcribed by the reporter? A. I have.

Q. Lately? A. I have.

Q. In his testimony Mr. Smith stated that he had built at Attica, Ohio, and taken over to Cleveland, Ohio, an incubator which he there ran for some two years, and I think the years that he said he ran it was 1913 and 1914, and then he described the structure of that machine. Do you understand that structure as Mr. Smith described it? A. Yes.

Q. Have you made or can you make a sketch of that machine which Smith described so as to help make it clear to the Judge?

A. Why, yes, if I had a piece of paper.

437 Q. Take some paper here and make it.

Mr. Ely: I object to that, Your Honor. Your Honor sat here and heard the testimony.

Mr. Williamson: Very much easier for you to understand it if we have the sketch. It is very much easier for you to understand it.

The Court: All right. Let him do it. Hurry along.

Q. Do it fast. Here, do it quickly.

The Court: He is drawing a plan and it will be marked afterwards. Just draw your sketch and don't say anything. You better have this marked and then he can refer to it.

Mr. Ely: I object to this whole procedure, Your Honor. It is entirely unnecessary, and certainly it is hearsay, and Dr. Smith was on the stand. He was here and he isn't here now.

The Court: He is undertaking to explain something there to the Court.

Mr. Williamson: That is all there is to it, Your Honor. The sketch produced by the witness is offered in evidence to be marked Defendant's Exhibit S.

Mr. Ely: Object to that, Your Honor.

The Court: It will be received.

Q. I want a brief description of the machine with the use of that sketch.

438 The Court: He wants the sketch. Give him the sketch.

(Defendant's Exhibit S marked for identification by the reporter.)

The Court: What you are undertaking to do is to say that you are embodying in this sketch what Mr. Smith's machine is as described by these articles.

Mr. Williamson: No, as described by Smith in his testimony. Smith described his machine as he used it at that time, two years before he applied for his patent, and this is a sketch showing one of the compartments, but he said he used three compartments.

The Court: This is a sketch, you think, which shows that Smith described in his testimony.

Mr. Williamson: Yes, just to help you.

Mr. Ely: I object, Your Honor. I think that should have been done when Dr. Smith was on the stand.

Mr. Williamson: Why didn't you ask him to do it?

Mr. Ely: Your Honor, it cannot be that is proving this so-called public use?

The Court: Well, gentlemen, I have let it in. I have already passed on that.

Mr. Ely: I want to object to any testimony in regard to the sketch, too, Your Honor, as entirely improper.

The Court: I will overrule the objection.

Mr. Ely: Note an exception.

439 A. This is my understanding, substantially, of the machine, from Smith's description on the stand. I understood him to say that there was, I think, three compartments and this is a cross-section, as I understood, of one of those compartments. That is every compartment, as I understood, was equal, would be the equivalent of the separate incubator that we are discussing. Now, in that incubator I understood that he had the trays on each side of the corridor. I think he said it was nine or ten feet wide, I can't remember the exact figures, but it was of that substantial size, and there were egg trays on each side of that central corridor which I have shown in this sketch as number 1. Those egg trays were stacked up in tiers. As I remember it he said he thought there were fourteen tiers high—fourteen trays high in each tier, and I believe he said eight tiers. Of course that would be non-essential as far as the sketch is concerned. The compartment, besides the trays, contained a central corridor at the bottom of which were some heating pipes. At the top of that corridor, central part of the sec-

tion I have, there was an electric fan which I am going to call 2, and he described that fan as driving the air downward over the heating pipes, which I am going to mark as 3, where it spread out and filtered back up through the trays on either side. Now, he described it as having thermostat control and the question of humidity was also described. I am not sure whether he said it had humidity or not, but I don't
440 think that was the question. It was a question of circulation. But this is my understanding of it—

The Court: That is a drawing of what he described in his language?

The Witness: That is in the language, that is the drawing of what he described.

Q. But he referred to three compartments, did he not?
A. He referred to three compartments.
Q. And each room had a fan?
A. Each of them had a fan.
Q. And they were all alike, weren't they, according to his description?
A. Yes, this sketch, as I said, represents one of those three compartments. My interpretation was that those compartments would be separate incubators.

441 By Mr. Williamson:
Q. Now, please pick up that Stulik German Patent again, just for one minute, will you please?
A. (Witness does so.) I have the German Stulik Patent.
Q. Do you recall what Mr. Taggart said about that patent, when I first showed it to him, and asked him whether it showed stage incubation or not?
A. He said that it did not show stage incubation, as I understood it, and there are several questions along that line in there.

Mr. Ely: Well, he did not,—

The Court: Are you making an objection?

Mr. Ely: Oh, I beg your pardon.

The Witness: I want to make my answer clear.

The Court: Well, of course, the record of what Mr. Taggart said is on record.

Mr. Williamson: Yes, that is on record.

The Court: And if he says it is different from what the record shows, he can correct him.

Mr. Williamson: Yes, that is what he said.

By Mr. Williamson:

Q. As a matter of fact, is stage incubation present and disclosed in that patent? A. Yes, sir.

Q. Mr. Taggart, at the same place, and about the same time, stated that there was no utilization of the heat from the eggs in the advanced stage of incubation for heating the eggs in the later stage of incubation; was that correct or wrong?

A. Well, do you mean, is his statement correct or
442 wrong?

Q. Yes.

A. His statement did not take into consideration that radiant heat was radiating down through. It was wrong.

Q. Well, as a matter of fact, in the Stulik patent, the heat from the chick in the advanced stages of incubation is utilized, isn't it?

A. Yes, it is radiated down to those underneath. It is utilized to the extent that there is a difference in temperature between the outlet layers, so it must be radiated downward to the other layers.

Q. Now, Professor Rowley,—

Q. (By the Court—interrupting) You say there is a radiation but they do not carry the air down?

A. No, it is radiant heat.

Q. (By Mr. Williamson) Well, the air has a limited outlet, hasn't it, in this Stulik machine?

A. Yes, sir.

Mr. Ely: That is objected to as immaterial.

Q. (By Mr. Williamson) Well, that Stulik machine shows the utilization of the heat, and the air doesn't all go down at once, does it, and won't the heat from the chicks in the advanced stage of incubation be heating all of the air in the incubator, or more or less so?

Mr. Ely: That is objected to as leading.

The Court: The objection is overruled.

443 Mr. Ely: Exception.

A. Yes.

Q. (By Mr. Williamson) Now, Professor Rowley, you have discussed the disclosure of the Smith Patent in suit, the Smith commercial machine, and so forth; and now you have been over and called the attention of the Court, to such of the prior patents and publications as you see them, relating to the prior art. I will now ask you to state whether or not

there is anything new over the prior art in the method of hatching eggs, as disclosed in the Smith Patent here in suit?

A. No, no.

Mr. Williamson: You may cross-examine.

Cross-Examination.

By Mr. Ely:

Q. Right along that line, Professor Rowley, is there any one patent or publication in the prior art, to which you referred, which shows a combination of stage incubation and the fan impelled draft of air?

Mr. Williamson: That is objected to as immaterial. This is not as to the operation of the patent; the claims are directed to a method; it is not a combination of different elements of the machine, but it is a method, the portion which calls for a sequence of steps, and therefore this question is immaterial.

The Court: The objection is overruled.

Mr. Williamson: Exception.

444 A. Will you read the question again, please, so that I may understand it?

(Previous question read by the reporter.)

A. I cannot say that there is any one patent that would embody all of those. The publications referring to the Smith machine and his testimony, describes a machine with a fan, and the circulation, the same as his present machine that he used without the curtains.

Q. (By Mr. Ely) Then the answer to my question is that there is no patent or publication in the prior art which shows the combination of stage incubation, and the application of a forced fan impelled draft of air?

Mr. Williamson: That question is objected to as immaterial. There is no claim in the patent that reads like that. There is no claim whatever in the patent that reads like that.

The Court: I think I have ruled on that question. The objection is overruled.

Mr. Williamson: Exception.

A. I have not found quoted any or all of those steps in that specific order.

Q. (By Mr. Ely) Then, the answer to that question is that there is not any?

Mr. Williamson: The same objection.

Q. (By the Court) None that you have cited?
A. None that I have cited. I am limiting that, of course, to all those specific cycles complete.

445 By Mr. Ely:
Q. Now, that setting of the eggs, and stage incubation, and the application of a fan impelled draft of air to those eggs is characteristic of the Smith invention, is it not?

Mr. Williamson: That is objected to as immaterial, and it is not true.

The Court: The objection is overruled.

Mr. Williamson: Exception.

A. Will you repeat the question, please?

(Previous question read by the reporter.)

Mr. Williamson: That is objected to as incompetent, this witness not having qualified as a patent expert. He is not a lawyer; he is a mechanical engineer.

The Court: The objection is overruled.

Mr. Williamson: Exception.

A. Well, I should say that the thing that is characteristic of the Smith invention, if anything at all, is setting the eggs in a particular arrangement for stage incubation, and directing the air over those eggs in a column downward, filtering up through the eggs, coming in contact with those in the advanced stage first, for the specific purpose of taking the heat off by convection.

By Mr. Ely:
Q. The Smith Patent shows, does it not, setting the eggs in various stages of incubation in a chamber, and applying a draft of fan impelled air over those eggs. Will you please answer the question yes or no?
446 A. I cannot answer it by yes or no. I will have to make my answer clear. I tried to explain the Smith Patent as I understood it in the specifications and drawings, and it states specifically one way of setting the eggs for stage incubation, and a particular way of applying the air; it describes specifically the curtains on there for directing the air in a column downward, through the corridor, under the eggs in the advanced stage, and filtering up.

Now, the Smith Patent is very clear in describing one particular kind of stage setting of eggs, and one particular

method or way of circulating the air, and for a particular purpose. It is very evident that the Smith Patent did not contemplate taking the heat off from those eggs by radiation. He put in the eggs in such a way, or in a particular manner or use for stage incubation, that he did not get the advantage of radiation; and he specifically stated that, and he showed everything. Now, I have tried to make clear what I understood by the Smith Patent.

Q. Now, without giving us a lecture on the subject, will you please tell me whether the Smith Patent discloses the setting of eggs in various stages of incubation, and the application of a forced draft of air over those eggs?

Mr. Williamson: The witness is instructed that he can answer it in his own way.

The Court: Well, he can answer the question.

Mr. Williamson: Yes, as long as it is responsive to
447 the question.

A. Well, I tried to answer it by stating that the Smith Patent does define a specific arrangement of spaces,—a specific setting of eggs for stage incubation, and a specific circulation of air, and that specific circulation is in a column downward through the corridor, and upward through the eggs. The Smith Patent does not describe the general circulation of air, nor does it describe in its specifications and drawings general stage incubation, excepting by that one particular method.

By Mr. Ely:

Q. The Smith Patent shows the setting of eggs in stage incubation, does it not?

A. It shows the setting of eggs in a method of stage incubation.

Q. Will you please answer my question: The Smith Patent shows the setting of eggs in stage incubation, does it not?

A. It shows a particular but not general method.

Q. Well, showing a particular method, it shows the general as well, does it not?

A. Not only that you can say,—

Mr. Ely (Interrupting): Will you read the question, please, Mr. Reporter?

(Previous question read by the reporter.)

A. No.

By Mr. Ely:

Q. In the Smith Patent, it shows, does it not, the application of a fanned, impelled draft of air through the
448 chamber, does it not?

A. It shows a fan impelled draft through a specific way, but not the general application of the fan impelled air.

Q. Do you find any patent in the prior art that shows a general setting of eggs in stage incubation, and the general application of forced air over those eggs,—is there any patent or publication in the prior art, that shows that?

A. No, no I don't think so.

Q. My last question is also characteristic of the Snow, is it not?

Mr. Williamson: What do you mean by "Snow?"

By Mr. Ely:

Q. The Snow incubator, and the way Snow operates it?

A. Well, Snow operates with a different method of setting his eggs by stage incubation than Smith, and he operates by a different method of circulating or agitating the air than Smith.

Q. Snow has, has he not, the setting of eggs in stage incubation in a chamber?

A. Snow has a different setting of eggs.

Q. Now, I did not say different from anything; I asked you what Snow had?

The Court: Of course, you can answer the question as to whether he has that. Of course, I understand that you claim it is different from the one that they have, but,—do you claim that it is different?

449 A. Yes.

By Mr. Ely:

Q. But Snow has a mechanically applied movement of air over those eggs, has he not?

A. He has a movement of air which is specifically different than the Smith.

Q. Well, I did not ask you whether it was specifically different.

Mr. Williamson: I think that the witness ought to be allowed to answer the question in his own way.

The Court: Well, I should think that he could answer the specific question.

Mr. Williamson: Yes.

A. Well, I would say "Yes," he has a motion of air,—what was the question, please?

(Previous question read.)

A. Yes.

By Mr. Ely:

Q. And you do not find that in the art prior to the Smith Patent, do you,—what Snow does?

A. Well, I certainly do,—about the Smith publication.

Q. No, I said prior to the Smith Patent.

Mr. Williamson: No, you did not; I beg your pardon.

The Court: Well, you mean outside of this disclosure?

Mr. Williamson: Smith's own prior use.

A. The prior use.

Mr. Williamson: Well, let him make his question read so that it is not confusing to the witness. The prior
450 art is one thing, and the Smith Patent is another thing, and the publication is another thing. Let him frame the question so that the witness can intelligently answer it.

By Mr. Ely:

Q. Then, from what you saw, aside from these publications in the two Cleveland papers, you did not find it, is that right?

A. And Smith's testimony.

Q. Well, of course, that is just what you have heard here in the court room, is it?

A. I believe that is correct.

Mr. Williamson: That is what he has got to consider.

By Mr. Ely:

Q. Now, will you please take these prior publications, and show me where you find in these prior publications any mention of stage incubation?

Mr. Williamson: That is objected to as immaterial. Stage incubation is no essential part of the process applied in the Smith Patent.

The Court: The objection is overruled.

Mr. Williamson: Exception.

By Mr. Ely:

Q. Please find me that in these publications?

A. Well, these publications describe the eggs as set in a full compartment at different times; they describe full setting in each compartment,—three compartments; of course, alternating the eggs.

Q. Yes, that is to say, these publications do not show
451 stage incubation?

A. Excepting by compartments they show stage incubation.

Q. Well, in separate compartments, but it does not show the placing of eggs of various ages of incubation in one compartment, does it?

Mr. Williamson: Now, I object to the question; it does not make a proper distinction between the different publications, or the publication taken from Ure's Dictionary of America. He is asking him about stage incubation without any distinction at all. If he will identify the publications that were referred to in the question, then the witness could intelligently answer it. Otherwise, I don't see how anybody could answer it.

By Mr. Ely:

Q. You understood my question; I was referring to those two publications in the Cleveland papers,—did you not?

A. Certainly, the Cleveland publications, I understood.

Q. All right. Now, will you go ahead and answer my question?

A. I thought I did answer that question on that basis.

Q. I don't think you did. I think Mr. Williamson interrupted you. Did he answer that question?

The Court: I don't think so.

(Previous question read by the reporter.)

A. The question, then, refers specifically to these Cleveland papers?

452 Q. Yes.

A. And the answer is, that they do not show stage incubation in each compartment.

By Mr. Ely:

Q. And you heard Dr. Smith's testimony, did you not?

A. Yes, sir.

Q. And you heard Dr. Smith testify that in 1913 and 1914, he did not have stage incubation, did you not?

A. Yes, I think he testified to that; I heard that.

Q. Now, if you put 33,000 eggs in one room at one time, what would be your heat conditions on the 20th day?

A. Well, I would have to figure that up; it would be pretty hot.

Q. It would be pretty hot, wouldn't it?

A. Yes, sir; that is a lot of heat.

Q. And when you put them in, it would require a lot of heat, wouldn't it?

A. Well, it would require enough to heat the eggs up, to bring them up to temperature with the evaporation.

Q. Then, when you had them in the endothermic condition, in the first period, you would have to supply a large amount of heat?

A. Well, you would have to supply enough heat to bring the temperature up to the hatching temperature; it would depend on what you started these eggs out with,—that is, the temperature.

453 Q. And then,when you get over to the exothermic condition, and you get about to the twentieth day (Mr. Ely looking at record), how many British thermal units would each egg be giving off?

(Chart submitted to the witness.)

A. According to this chart, there would be given off four large calories, or about sixteen,—

Mr. Williamson: (interrupting) What chart are you using?

The Witness: Plaintiff's Exhibit 2.

A. (continuing) —of about sixteen British thermal units.

By Mr. Ely:

Q. What is the best or the closest approximation to the Smith invention in the prior art or publications to which you have referred?

Mr. Williamson: Now, if Your Honor please, he is using the word "invention" there again. That means that he is calling on this witness to interpret that claim, and we object to the interpretation.

Mr. Ely: I will change that to method.

The Court: Yes, say method.

Mr. Ely: Yes, method; I am sorry; I did not mean to say that.

Mr. Williamson: The method of hatching eggs, or something of that kind.

Mr. Ely: All right.

Mr. Ely: When you are making remarks, will you
454 please not speak so loud?

(Previous question read by the reporter.)

Mr. Ely: Make it read "method," instead of invention.

Mr. Williamson: I would like to know whether prior usage is also included in that question.

Mr. Ely: You can include prior usage, if you want to.

The Witness: You asked me, which is the closest?

By Mr. Ely:

Q. Yes.

A. Well, it is very difficult to pick out any one that is specifically the closest, because your stage incubation, of course, is shown in the usage and in the patent,—the stage incubation is shown in the prior patents, and also in the publications on incubators; and the fan is shown in the prior use.

Now, it is very difficult to say which of these is the closest, because you are comparing those things and I don't know how to,—

Q. (interrupting) That is, your difficulty arises from the fact that you have not got any one patent or publication which shows that they have, isn't that the trouble.

A. You have got all of the stage incubation.

By the Court:

Q. You have got the fan in one, and you have got the stage incubation in another, and you cannot make a comparison as to which is the closest?

455 A. No; you cannot say definitely which is the closest, that I can see.

By Mr. Ely:

Q. Now, what patents of the prior art show stage incubation,—I have here Stulik, Zimmer, Winkler, and Ure's dictionary,—that is complete?

A. Well, I will have to check those through; I think that is the proper way to do it.

Mr. Williamson: If Your Honor please, the witness did not pick out and explain to Your Honor all of the patents that we set up and introduced, and so, perhaps, it is difficult

for him to answer that question. If he is asked about those that he specified, I suppose he could readily answer the question.

Mr. Ely: I will include that in the question.

The Witness: I think those are the ones that I have specified.

Mr. Williamson: The ones that you specified.

The Witness: The ones that I specified; I think there were four of them.

By Mr. Ely:

Q. Now, will you look for the Stulik Patent and look at that, please?

A. (Witness does so.)

Q. Now, as I understand the Stulik Patent,—and, please correct me if I am wrong,—it shows a sort of a tower, in which there are a number of egg trays; that is right, isn't it?

A. I don't know that you would call it a tower,—
456 which is more accurate. Of course, the relative size is not necessarily shown in this figure; I would not call that a tower.

Q. All right. A cabinet which is higher than it is wide,—we will put it that way,—in which there are a number of egg trays, that is right, isn't it?

A. Yes, sir.

Q. And you apply the heat, the hot air, from the bottom, at "C,"—at the small tube "C," that is right, isn't it?

A. Well, you cannot say that that is the application of the heat; that is the air going into the incubator. The heat, of course, is applied around the outside.

Q. All right. That is where the air goes into the incubator, through that pipe "C?" A. Yes, sir.

Q. And that is at the bottom of the incubator, in the cabinet, isn't it? A. Yes, sir.

Q. And the air goes out at the top, through that pipe "D," that is right, isn't it? A. Yes, sir.

Q. And in the operation of the incubator, as described in the patent, you put your fresh eggs in at the bottom, that is right, isn't it? A. Yes, sir.

Q. And then when you get ready to put the next set in, you move it up, and put the fresh set underneath, that is right, isn't it?

457 A. Yes, sir.

Q. And so on, until you get the cabinet full?

A. Yes, sir.

Q. And then, when you get the cabinet full, you have got fresh or new eggs at the bottom, and the old eggs at the top, that is right, isn't it? A. Yes, sir.

Q. And the eggs that are at the bottom are endothermic, that is, they have to have heat applied to them, that is right, isn't it?

A. It depends on how far they are along,—at what time they are new eggs.

Q. Well, I am assuming that we have the compartment full of eggs at all stages of incubation? A. Yes, sir.

Q. Now, the purpose of that patent, as I read it, is to apply the hot air to the lower eggs, because they require more heat, isn't that right?

A. Well, that is stated in a part of the specification here, I think. It is also stated that it uses heat in the more advanced stage.

By the Court:

Q. Well, as a matter of fact, that is the way they do it?

A. They do it, as he has described it, that is correct, yes.

By Mr Ely:

Q. And then, the hot air from the hottest eggs, being 458 at the top, will escape out through the pipe "D," won't it?

A. You mean the warm air or the hot air going through up to "D?"

Q. I am saying that the hot air that is generated by the heat at the top, rises, as all hot air rises? A. Yes.

Q. And it passes out through the opening "D?"

A. Yes; that is, when that opening "D" is open, of course; it might be closed. If that is the fact,—

Q. (interrupting) Well, you don't find any instructions in the patent about closing that opening, do you?

A. No, there is a thermostat control there.

Q. You do not find anything about closing that opening, do you? A. (No answer.)

Mr. Williamson: Take your time in looking that up, if you want to.

A. (Witness looking at record) No, I don't find that that thermostat regulates that; it states about regulating the heat.

By Mr. Ely:

Q. Now, as a matter of fact, the way the Stulik machine operates is to apply heat to all the eggs, but to the eggs

in the earlier stages of incubation to a greater extent than those in the later stages, that is right, isn't it?

A. Yes. The heat is applied to all of the eggs in the
459 Stulik Patent. Now, you must distinguish in here the methods in which they are applying the heat. You see, the heat is applied in the Stulik Patent by two methods: First, you have got a water jacket around the sides, and, second, you have got the air which comes up through pipe "C".

Of course, you must distinguish whether that heat is heating the air or cooling the air; it may be either. Your question implies that that was hot air, of course,—that that was hot air coming up through the pipe.

Q. Well, I will read you the translation of the claim, that I have here, which was a translation which was used in the Cooley case.

Mr. Williamson: Is that a claim of Stulik?

Mr. Ely: A claim in the Stulik Patent.

Q. (continuing) "Hatching process with entering of the eggs in batches and simultaneous treatment of the different batches of the eggs introduced into the incubator at different times, characterized in that the batches of eggs introduced into the hatching space at different times are exposed directly to the same hot air current in the manner that the batches of eggs, in different stages are arranged in the direction of the hot air current at a gradually increasing distance from the source of heat, in which connection the hot air current passes first over the batch of eggs freshly introduced into the hatching space and consecutively the older batches of eggs imparting to the individual batches of eggs such an
460 amount of heat as is required, taking into due consideration the natural heat of the eggs which differs at the various periods of time so that in the entire hatching space a uniform temperature prevails."

Now, that is correct, is it not?

A. I don't know.

Mr. Williamson: Just a minute. I object to that question on the ground that it is incompetent. Counsel has submitted a claim there which defines the issues involved in the Stulik Patent, under the German Patent, and the disclosure of the patent depends upon written specifications, on the descriptive part of the specifications, and the drawings. This witness has not qualified as a patent expert, and it is entirely

improper to ask him to treat that disclosure as if it all depended upon the patent claim. If he had coupled the claim with a description of the drawing, I would have no objection to the question.

Mr. Ely: I think you asked him about this claim yourself.

Mr. Williamson: No, I did not.

The Court: The objection is overruled.

Mr. Williamson: Exception.

By Mr. Ely:

Q. Is that a correct statement of the way that works?

A. Well, I would have to study it a little more; I cannot answer that kind of a question right offhand.

461 Q. All right, here is the statement. (Document submitted to the witness.)

Mr. Williamson: Now, this witness can hardly be called upon to read this whole record in another suit, Your Honor.

Mr. Ely: I am not asking him to do that.

The Court: Gentlemen, I am going to allow counsel to cross-examine this witness, and if there is any specific objection that you have, why, I will hear it, but I cannot say that he cannot read that, in order to answer the question.

Mr. Williamson: No, but my objection was that he is asking him to give an opinion on a claim instead of a disclosure of the patent.

The Court: Well, he has undertaken to tell me what that patent means, and explain it to me. Now, he is under cross-examination, and is endeavoring to show by him whether or not he has explained it right to me. The objection is overruled.

Mr. Williamson: All right. Exception.

A. I would like to have a little time to read this over, Your Honor.

The Court: We will take a recess at this time.

(Recess.)

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462 Mr. Williamson: Before the witness answers the question last put to him, I ask Your Honor's permission to substitute for the document that was put in his hands by Mr. Ely, the official translation of that Stulik Patent made

by the official translator of the U. S. Patent Office, the certified copy of which is in evidence.

Mr. Ely: I have no objection. Perhaps I better reframe the question. I did not have this official translation, Your Honor. Let it be noted that the last question is withdrawn, and I will ask another question.

Mr. Williamson: It is the official translation used in the Stulik case.

By Mr. Ely:

Q. Now, Mr. Rowley, in the Stulik Patent, the current of air is a convection current arising through the machine, is it not? A. Yes.

Q. That is the only current of air which would arise and which is described there?

A. That is the only one unless you add eddy currents inside.

Q. But it is a convection current, is it not, which starts at the bottom and rises up through the incubator?

A. Yes, you can call it a convection or gravity current.

Q. It rises by the fact that it is a heated current applied at the bottom? A. Yes.

463 Q. As it comes up, it first strikes the coldest eggs, doesn't it? A. Yes.

Q. Then passes on to hotter eggs? A. Yes.

Q. Then on to still hotter eggs? A. Yes.

Q. So that any heat picked up midway in the column of hot eggs would be carried by that current to still hotter eggs, wouldn't it?

A. Literally speaking, yes. I would like to explain that it may not pick up heat. It may give the heat to those eggs. If it passes up through, it may not pick up heat from those eggs; it may give them heat.

Q. That is when the eggs are hotter than the current, or each batch of eggs that is hotter will give off heat to that current of air? A. Yes.

Q. Assuming, for the purpose of answering my question, that that air is about 99 or 100, it will pick up heat units from hot eggs and carry those heat units to still hotter eggs, will it not?

A. Well, it depends upon whether you mean by hot eggs, hotter than the air, or not. You assumed the air was 99 degrees, did you not?

Q. Or hotter.

464 A. When you speak of that as coming in contact with hot eggs, it depends upon how hot those eggs are.

Q. Let me put the question this way: If there are any heat units picked up by that current of air in the eggs in some intermediate stage of incubation, those heat units will be carried by that current of air to eggs which are still hotter, isn't that true?

A. Well, it will be carried past those,—if that current of air comes in contact going up there, with hot eggs, and picks up heat, then that heat will be carried right on up the next layer. It will not take up the heat from that air.

Mr. Williamson: I don't think your answer was completely gotten down.

The Witness: It will carry it past them. They are hotter and they will give their heat up to the air. In order for the heat from this air to pass into the upper eggs, the air temperature must be hotter than those eggs in that upper layer.

Q. Then, I take it, from this Stulik Patent, there will not be any heat units transferred from hot eggs to cold eggs by the current of air.

A. I want to make it clear. I think your question was that the current of air,—read me the question, will you?

(Last question read by the reporter.)

A. No, that is going in the opposite direction.

Q. That current of hot air will pass out at the top of
465 the machine without ever reaching the cold eggs at the bottom, is that right?

A. Yes, after it passes them, of course.

Q. Now, then, as I understand it, the cold eggs do not get any benefit of the heat from the hot eggs, in Stulik's, by the current movement of air.

Mr. Williamson: That is objected to as a repetition.

The Witness: I think that is the one I answered, but I want it clear, that this radiated heat may be up or down,—don't mix those two up.

Q. In that question I was speaking about heat being carried by a current of air? A. Yes.

Q. In regard to radiant heat, you say that the old eggs will get some radiant heat, and the fresh eggs will get some radiant heat from the old eggs?

A. The eggs there below in the lower tiers, with warmer eggs above, will receive some heat from those warmer eggs above by radiation.

Q. Radiation of heat hasn't anything to do with the current movement of air, has it,—it is a separate way of heat radiation, the movement?

A. Yes, radiation is a separate movement.

Q. Radiation does not depend upon direction?

A. Well, I don't know as I understand your question.

466 Q. Heat radiates from a hot body in all directions?

A. It radiates directly off from the body.

Q. In all directions? A. From the exposed surface.

Q. It doesn't make any difference what side of an object you want to heat by radiation,—it gets the radiation just the same?

A. If I understand your question properly, if there are two surfaces, one of them hot and one of them colder, and they are adjacent to each other, or separated, it will radiate from one to the other.

Q. It radiates up and it radiates down?

A. If the heated surface is also on the upward and downward side, it will radiate directly from that surface.

Q. I say the radiation you have been claiming for Stulik, the radiation from hot eggs is downward in this cabinet, is it not? A. Yes.

Q. Would it make any difference to that radiated heat if that thing was operated upside down, radiated heat?

A. No, it would be radiated from the warmer eggs to the colder eggs, just the same.

Q. Whether it was up this way, right side up, or whether it was upside down?

A. That is true. Your question is, it would either way, but the point of the difference between that which I

467 want to explain, if I may, and the method where the eggs are standing in different stages, is the degree of radiation. In this arrangement,—

Q. I am afraid you are trying to go ahead and answer more than my question called for.

Mr. Williamson: I ask that the Court give the witness permission to answer the question.

The Court: I do not think he was answering the question. He is asking concerning that particular thing, and not a general argument.

A. I will say yes, either way.

Q. Then the arrangement I have here, with this upside down, is the specific arrangement shown in the Smith Patent, with the eggs over there along at the bottom, isn't it?

A. It is in regard to the stage, excepting that in here you have only eight trays, whereas in the Smith you have more trays, more divisions in your heat line.

Q. That is to say, Smith possibly adds four trays to this?

A. Yes, it has more steps in the process.

Q. Wouldn't you get in Smith the same radiation as you get in Stulik?

A. The questions are confusing somewhat. I will have to make clear my answer. Your questions that you have been putting to me now were strictly on the radiating heat from that upper layer downward in Stulik, or, if you reverse it, from the lower layer upward. That is true the
468 way you have stated it, but, to complete the process in the Smith arrangement, if we assume a tray of eggs in any stage, we will say the twentieth day, for illustration, now, that tray of eggs will, of course, be radiating a little heat upward to the next lower stage, but, at the same time, it will be receiving heat from the stage below it, so you see, so far as the egg itself is concerned, while radiation will be going on, the egg will be receiving and giving off radiant heat at the same time,—giving off a small portion of it at the upper part, and taking on a small portion at the lower part. The balance depends upon which happens to be greater, and that can only be gotten from the temperature.

Q. That is to say, so far as radiating heat is concerned, it would not make any difference in Stulik, whether this was upright, as shown, or whether it was the reverse?

A. Between the trays, it would be the same; that is, the trays would radiate either way, up or down.

Q. In Smith, the trays are arranged in the reverse order from Stulik, is that right? A. Yes.

Q. Let us go on to the Zimmer Patent, please? Will you take the Zimmer Patent, please? In Zimmer you have a chamber here, a sort of a cylindrical chamber, don't you, which is closed, except for an outlet opening at the top 13?

A. It is closed, but it states in the specifications that automatic ventilation is also claimed, so there must
469 be an inlet at the bottom.

Q. Where is that inlet?

A. It is on page two, line 31. It says: "Moreover, the incubating chamber is automatically ventilated."

Q. You do not see anything to automatically ventilate it except that opening at the top?

A. If there is a passage for the air going out, it must be assumed the air must get into the incubator, and it is stated in the specifications that it is automatically ventilated.

Q. That is to say, you do not see anything described in the specifications for securing that automatic heat ventilation, except that opening at the top?

A. It states here, in line 31, page two: "Moreover, the incubating chamber is automatically ventilated, as will be understood."

Q. That refers to that automatic operation of the lid 13, doesn't it?

A. It doesn't state that. It simply states that you understand that it is ventilated.

The Court: Does he point out where it is ventilated, except at 13?

The Witness: I don't know that the patent is specifically clear upon that. Some of these patent drawings are not,—just a minute, let me check that over. There is an opening on Figure 4 from the chick chamber there, 35, and 36,
470 the cover. I will have to see if I can find that here. It says there that that opening is provided with a nursery, on page three, line 33, straight down, it says: "I also provide a nursery 34 for the newly hatched chickens. This nursery is on one side of the incubator directly in contact therewith, and is reached by the chicks through an opening 35, with which the incubator is provided, there being a slide 36 to cover this opening when desired." Of course, that opens directly into the incubator, and has a slide, which is described, to cover it when desired. It also states that ventilation is provided, so I assume that must be the opening into the incubator.

Q. That is the only thing that you can find there that might apply there?

A. That is all I can find right now, without looking closer into the patent.

Q. As a matter of fact, that is all there is?

Mr. Williamson: He has already answered it.

The Court: If anybody can find it, the record so shows.

Q. When you operate this Zimmer incubator, if I understand the operation correctly, as I go along, you first put your,—your incubator is warm?

A. Yes.

Q. Then you put in a layer of eggs in a tray at the bottom? A. Yes.

471 Q. And then the second day you take out that layer of eggs, and you put in another layer of eggs at the bottom, is that right? A. Yes.

Q. Then you put this feather mat over the top of that tray of eggs that you just put in? A. Yes.

Q. That feather mat, as shown in Figure 1, is somewhat thicker than the thickness of the egg as it is shown there, isn't it,—thicker than the short diameter of the egg?

A. The distance between there is,—I don't know how much of that is tray, and how much is mat.

Q. But the tray is open at the top, and that feather mat is supported on top of the eggs, isn't it? A. Yes.

Q. Then you put your layer of eggs which you just took out of the incubator back on top of that feather mat?

A. Yes.

Q. And so the weight of that second layer of eggs rests on the top of the first layer of eggs, that is right, isn't it?

A. Yes.

Q. Then you go on, and on the second day you take out two layers of eggs, and you put another tray of eggs in, isn't that right? A. Yes.

472 Q. Then you put on another feather mat?

A. Yes.

Q. Then you put the two trays that you have taken out back in again? A. Yes.

Q. All this time heat is being applied? A. Yes.

Q. Then you keep on until you have got ten trays of eggs in that machine, don't you? A. Yes.

Q. Every day you have taken out these eggs and put in a new tray at the bottom, you put the stack back on again?

A. Yes.

A. At the tenth day, the lowermost tray was supporting the weight of the nine layers of eggs, and the nine mats, and the nine trays, that is right, isn't it? A. Yes.

Q. Now, during that time those eggs are endothermic?

A. I am not sure they are all the way; I think towards the end of the period they are exothermic. This curve shows practically between the third and fourth days they begin to be exothermic.

Q. You heard Mr. Taggart state that the division point between the two is about halfway through the process?

Mr. Williamson: That is objected to as immaterial. Mr. Taggart is not reliable.

473 Q. Do you dispute that?

A. I am going by the curve here, which shows the change about four or five days, when it begins to be exothermic.

Q. Never mind. It is not important. You have got your ten layers of eggs in there separated by these thick

feather mats. Is there any propulsion of the air through there?

A. The only propulsion of air is by convection in gravity.

Q. Through that small opening at the bottom 35, and out through the opening at the top, if that thing is open?

A. That is correct.

Q. How much air is getting to the eggs in the middle of that stack?

A. That is a pretty difficult thing to say, because you cannot tell how dense that feather mat is, nor the possibility for infiltration of the air.

Q. It is just too bad for the embryo that happens to be in the middle of that stack, isn't it, so far as getting air is concerned,—he will suffocate in there?

Mr. Williamson: What is the question?

The Court: He says, would it be too bad for the egg in the middle of that stack, and whether it would get sufficient air.

A. I will not say it could not get sufficient air. It depends upon how dense those feather mats are. I couldn't state; I couldn't answer that.

474 Q. After you have got your ten days stacked up, you let it set for two more days, and then it is twelve days? A. Yes.

Q. Then you have got to take those ten trays out and you reverse them and put them back in the reverse order, don't you? A. According to this description, yes.

Q. So that the furthermost advanced eggs are at the bottom? A. Yes.

Q. And you let it stay in there for nine more days, don't you?

A. Yes, I believe so, finish up the period.

Q. During those nine days, assuming that the embryos are all alive, those eggs are getting hotter and hotter, aren't they?

A. They are generating more and more heat. I cannot say they are getting hotter and hotter. It depends upon how much air you have in below.

Q. You haven't seen any way of letting in more air except through that hole?

A. No, but the relative size of that small hole can be taken from the scale here. That is supposedly big enough to supply ventilation.

Q. You have got a lot of eggs in there, and they are all pretty hot. You carry along for nine days. Now, you are

ready to hatch your first eggs, assuming that the chicks are still alive, you are ready to hatch the eggs?

A. Yes.

475 Q. You have got to take that whole stack out again?

A. Yes.

Q. You put some props down there, and then you leave the eggs in underneath so they will hatch, is that right?

A. Yes.

Q. The weight of those eggs that is on top of the bottom layer of eggs, it says it flattens out the eggs. You read that part in the specifications, didn't you? A. Yes.

Q. That is too bad for the embryo in there, too, isn't it?

A. I don't know how much, that may be true,—I don't know whether it flattens those eggs out or not.

Q. That is what the patent says?

A. That does not change the principle of incubation. The patent says that.

Q. The patent says it flattens the eggs out, and he says the shells get brittle, doesn't he?

A. He states that, or something to that effect.

Q. So that the eggs can be squashed or squeezed down, as that right?

A. I don't know that you can squeeze them down just because they are brittle.

Q. The patent says so, doesn't it?

Mr. Williamson: The witness is instructed that he may refer to the patent every time such a question is put to him, if he wants to.

476 The Witness: There is something in here about the weight, but I don't know about that particular statement. I would have to hunt it up.

Q. Do you think that will work?

A. Well, what part of the process?

Q. The whole thing. Do you think you will get any chicks out of that thing?

A. There is no reason, if you keep your temperature controlled in there, if you want to go through that process.

Q. But you have no means of keeping your temperature controlled, have you?

A. You have got air coming up through.

477 Q. It is the air through convection currents?

A. The air through these mats,—we don't know what the porosity of those mats was.

Q. Your eggs are lying between two feather beds, one on each side? A. They are feathered mats.

Q. Feathered mats or feathered beds.

Mr. Williamson: Chickens have feathers.

Mr. Ely: In the embryo?

Q. There isn't any forced draft in that patent?
A. The draft in there is gravity,—controlled by gravity.
Q. Did you ever know whether this Zimmer machine operated? Did you ever find out whether anybody worked this machine? A. No, I haven't.
Q. It is a sort of a fireless cooker, isn't it?
A. No, I wouldn't call it that. A fireless cooker does not ventilate or cook off. That is for a different purpose.
Q. Is that the best reference that you have for such incubation?
A. As I stated before, I cannot say what the best reference is. That is pretty hard to say that with reference to a particular reference.
Q. Now, let us see, the Winkler patent you referred to showing staged incubation? A. Yes, I referred to that.

478 Q. Now, as I understand that patent, and correct me if I am wrong, the chicken eggs are put in, looking at Figure 2 of the patent,—

The Court: I do not believe I have before me that Winkler patent.

Mr. Ely: This is the one, Your Honor.

Q. In looking at Figure 2 there, the opening in which the hen eggs are supposed to be placed, is the opening d-2, is it not? A. Yes, the back.

Mr. Williamson: d-2.

Mr. Ely: Yes.

Q. Then they are put on that conveyor and dragged over the inclined surface and then they come around the sprocket B, and drop down onto the next layer and then down over the sprocket d-5, onto the next one, and then on out. Is that right? A. That is substantially what they do.

The Court: Don't they go up here first?

Mr. Ely: No, they come down here.

The Witness: That upper one is for ducks, or for a longer period.

Q. Now, you do not find any forced draft in that machine, do you?
A. No, there is nothing but the convection currents.

Q. Each run of that conveyor is separated from the run in above it by a curved water pan that goes all the
479 way across the machine, isn't it?

A. It is separated in a part of the machine. Those pans do not run from front to back.

Q. Except at the sprockets, that is true, isn't it?

A. Yes.

Q. Does that operate at even temperature?

A. Well, it operates by the temperature,—the hot water temperature which is circulated through the heating trays.

Q. That is, each separate run of that conveyor is heated at a different temperature, isn't it?

A. The same water, of course, circulates, but, as it comes down naturally it cools. It is gravity circulation.

Q. So that heat is applied to the eggs in three or four runs of that conveyor, isn't it?

A. Yes, if I understand your question, that is correct.

Q. The patent says that the temperature is varied in those various tiers or sections of that incubator, is that right? A. Can you refer me to the place?

Q. I will refer you to page 1 on line 20. A. Yes.

Q. That is, you do not have an even temperature through the incubator, which is characteristic of an incubator where there is a forced current or movement of air through the incubator, do you, you do not have that even temperature?

A. You have it regulated by the water. You do not have the forced air circulation, no.

480 Q. You never saw a machine like this in operation, did you? A. No.

Q. Where you put in eggs at one end and chickens come out the other? A. No.

Q. You never saw such an incubator as that, did you?

A. No.

Q. Now the other one I think you referred to was Ure's Dictionary. Let us look at that. A. I have the book.

Q. Except that Ure says that you put in one-twentieth of the eggs at one time, he does not give you any directions as to where you should place those eggs, does he?

A. No, I don't think there is any there.

Q. There isn't anything said about moving the eggs at any time, is there,—so far as this goes, the eggs set in the same place in which you put them? A. That is right.

Q. This is a closed cabinet?

A. Yes, substantially closed.

Q. No means for circulating the air except by such convection current as might arise out of it, are there?

A. There is no opening there that I see on the cabinet.
Q. Well, that is not the question I asked.

(Last question read by the reporter.)

A. You apply that simply to the circulation in the cabinet?

481 Q. Yes. A. Yes.

Q. Those eggs are illustrated as reposing on shelves across that machine, aren't they? A. Yes.

Q. Or trays? A. Yes.

Q. You will recall that in another set of drawings of Ure's that were cited in the case, those were referred to as shelves instead of trays. A. I don't recall that.

Q. There is another citation you raised from Knight's Mechanical Dictionary. Do you recall that?

Mr. Williamson: He did not look at that.

The Witness: I did not see that.

Mr. Williamson: That is not in Ure's. That is in Knight's.

Mr. Ralph Williamson: That has been withdrawn.

Mr. Williamson: We do not rely on that. I rely on Ure's. It should have been that book, there was a reference to Knight's Mechanical Dictionary which also had a small cut of this same structure, but, in response to the order to show cause, we took that out.

482 Mr. Ely: All right.

Q. In this machine the heat is supplied by water which passes through from this heater R and goes up to the top of the cabinet, and then goes in a serpentine path back and forth between the several layers of eggs. That is right, isn't it?

Mr. Williamson: No, between the trays, not the eggs.

The Court: The water first enters at the top, doesn't it?

The Witness: Yes.

The Court: By these various pipes. It goes along there.

Q. The water goes in a serpentine path through these pipes between the various layers of eggs? A. Yes.

Q. You understand that in such a circulating system, the water will always be hotter at the top, and gradually cools off as it goes down?

A. Yes. That, of course, depends upon friction in the pipes. If you have large free circulating pipes, the drop in temperature is very low or small.

Q. Suppose we put some eggs in on the top layer,—on the top tray, and there being nothing there to move those eggs, those eggs would be subjected to the same temperature during the entire period of incubation, wouldn't they?

483 A. Unless you change your water temperature, of course,—you must change your water temperature. You referred to this as a patent. You mean a publication?

Q. Yes. If you change your temperature of the water, you would affect the eggs that were in the lower trays, that had been put in in the meantime?

A. It doesn't state in here how they are set in what stages at all, and they may be partly set on each stage. That may be provided for in this method.

Q. You are assuming that?

A. I have got to assume there might be a way here. I cannot assume the most disadvantageous way.

Q. In setting an egg in there, it stays in the position in which you put it?

A. So far as I know. There may be other methods. This is not a complete, detailed description of the method of setting the eggs, except it states one-twentieth of the whole number is set, and so on by stages, but it does not state specifically what particular trays are set at different times.

Q. Of course, you understand, in order to anticipate, the description must be in the publication, don't you?

Mr. Williamson: That is objected to as incompetent. This witness is not a lawyer.

The Court: Well, I will assume it must be in the publication. I am assuming to constitute anticipation, it must state the things that it anticipates.

Mr. Williamson: Exactly, but that is not the question that was put to him.

484 Q. Now, having put some eggs in that so-called incubator, they will be subjected to heat at the same point in the circulation of the water during the whole period, won't they?

A. Well, as I have stated it depends on how you control the water temperature in the period, of course.

The Court: You can heat up the water more or less.

The Witness: Yes, you can change the temperature.

The Court: If you run it at an even temperature, why it will be hotter above and cooler below.

The Witness: If you run it at an even temperature, and wouldn't take any advantage of the incubating heat of the eggs, if you didn't distribute the eggs properly, yes.

Q. Well, then your eggs, when they get hot in the latter stages of incubation, are still subjected to the same temperature of water provided you did not change your heat of the water in the meantime, that is right, isn't it?

A. If you didn't make any changes then you would have the same heat of the water.

Q. If you didn't make any change in the heat of the water, you would have your eggs, when they were in the later stages of incubation and when they were giving off this heat, you would have them subjected to the same heat, wouldn't you, as you had at the first when they were cool?

A. If you didn't change your temperature, yes.

Q. Yes, if you didn't change your temperature.

485 A. Change your temperature of water.

Q. There is nothing in the publication about changing the temperature of the water during the progress of incubation, is there?

A. Well, it says, up in page 652, the second paragraph under 2, describing the machine, of a regulator calculated to maintain an equitable temperature.

The Court: Well, as a matter of fact in this machine, wouldn't you have a very hard time regulating the water so as to keep the eggs at an even temperature?

The Witness: No, not if you wanted to control the temperature of the water. It is very easy to control the water temperature. That could be very easily done if you stacked your eggs in there.

Q. That being true, and if this did contemplate lowering the temperature of the water as incubation progressed, what is going to happen to the eggs that you put in on the 20th day?

A. If you lower the temperature for the others, it is understood then that the staged incubation could be so arranged that you take advantage of the heat of those eggs in the advanced stage for those later ones.

The Court: How could you do that in that machine?

The Witness: You might stick them all underneath—together on the same trays together, take your eggs and change them around. It says, staged incubation, but it doesn't define the specific method.

486 The Court: It doesn't tell you how to do it.

The Witness: No, you could do it, of course. It doesn't tell the specific details.

The Court: You think heat could do it?

The Witness: Control those?

The Court: So as to give them the right heat at the right time.

The Witness: I could if I could change the eggs around and control the water temperature.

The Court: It would take a great deal of work to do that.

The Witness: That is true with a good many of these water heaters. You have to study the problem and get the right sequence.

Q. The minute you cool that water for the hot eggs so as to adapt that water for the hot eggs, you have brought it down to a temperature where it won't apply as far as the other eggs are concerned, isn't that right?

A. If you keep the temperature in that chamber properly regulated, if you mix the eggs, I can't say that you are right on that.

Q. You mean to say that your temperature requirements, you have got to balance and lower your eggs carefully with respect to their age and also with respect to the temperature of the circulating water.

A. Well, yes, you have got those two means of con-
487 trol that is in the open and you will have to work that out.

Q. You don't find any way of working that out described in this publication?

A. No, it isn't described as to how you set your eggs in there. It says that they are set in stages, but it doesn't describe the details.

Q. That is, this publication leaves a lot to be done yet before you can hatch eggs successfully, is that right?

A. The publication states it has been used successfully, so it must have been properly regulated or they couldn't have used it.

Q. The publication leaves much to be done in order to get chicks out of there, and hatch eggs successfully and get chicks doesn't it?

A. Well, of course that is true with any incubator, a man must know how to operate it. He has got to be experienced in that particular incubator.

Q. That isn't my question. I asked you if the publication didn't leave much to be done?

The Court: It doesn't tell you how to do it.

The Witness: No, it doesn't tell you how to do it.

Mr. Williamson: All these patents and publications have to be interpreted with ordinary common sense.

The Court: The question is, with ordinary common sense, with this one, you could?

Mr. Williamson: It certainly would.

488 Q. As far as you know this publication says this was used at the time of the French Revolution. You don't know that it has been used since, do you? A. No.

Mr. Williamson: That is immaterial.

Q. Now, in this Ure's publication, the top of this chamber is going to be hotter than the bottom, isn't it? The hot air is going to rise to the top of the chamber?

A. The hot air?

Q. Yes.

A. Yes, but of course it depends on how you—that is true. It depends on how you place your eggs in there. The eggs will have something to do with it, but just from the water it will be hotter.

Q. That is left to the imagination or discovery, isn't it?

A. Well, I wouldn't say imagination any more than any of it.

(Preceding answer is read by the reporter.)

The Court: Just a moment. He was asking the reporter to read him something and of course if two or three are talking the reporter can't do anything.

Mr. Williamson: I wasn't talking.

The Court: No, but the witness was.

Mr. Williamson: The witness said something. I don't know as it was recorded.

The Witness: I want the answer clear.

Q. Go ahead.

A. I understood you, there was certain things left to
489 the imagination. My answer was there was certain things we had been discussing here right along, a question of interpretation and regulation.

Q. I understood you to say that you had seen the file wrapper of the Smith patent, that is right, isn't it?

A. Yes, I have seen the file wrapper.

Q. You are aware of the fact, are you not, that the Stulik and Winkler patents were both cited in the patent office and the application allowed over them?

A. They were both cited.

Q. And the patent allowed over them, that is right, isn't it? A. Well—

Q. That is, they were cited by the examiner during the prosecution of the case?

A. There are certain patents cited—

Mr. Williamson: I object to this question as incompetent, Your Honor. This witness does not qualify here as a patent expert or lawyer.

The Court: Why did you ask him whether he had seen the file wrapper?

Mr. Williamson: So as to find out whether he had inspected these patents that were cited. I am perfectly willing they should examine him.

The Court: The objection is overruled.

Mr. Ralph Williamson: I would like to instruct the wit-
ness that he may examine the file wrapper record be-
490 fore he answers the question.

(Question read by the reporter.)

A. Yes, I think they were, without looking at it.

The Court: Gentlemen, the file wrapper will show itself, and you can afterwards in arguing this case, point out that which the file wrapper shows.

Mr. Wiliamson: Yes, but it will take a long time to do it, Your Honor.

The Court: Yes, but it won't take as long as it would to ask the witness.

Mr. Williamson: Yes, I can do it by argument. That is what I expected to do, and that is why I didn't ask him about the details of the file wrapper.

The Court: That is just what I was saying.

Mr. Williamson: It is a waste of time to ask him about it.

The Court: That is just what I was saying, that it can be covered in the argument.

Q. With regard to these tests you made of the Smith machine without the curtains, when did you make these tests?
A. When?
Q. Yes. A. Last Sunday.
Q. This last Sunday?
A. Yes. You are talking about the tests I testified to this morning?

491 (Question read by the reporter.)

A. Yes, that was last Sunday.
Q. What is the process of ordering tobacco which is described in one of the Proctor & Knowles patents. What do you mean by that?
A. That means getting it in a proper condition for working, getting in the proper amount of moisture and workability.

The Court: To get it into condition to roll it into cigars?

The Witness: Yes, it will dry out and get brittle if you don't—

The Court: Conditioning.

Q. That is it is adding moisture to the tobacco so as to dampen it, isn't it?
A. If the tobacco is too dry it is adding; if it is too wet, it is taking it away. There is a point in there where it works better.
Q. How long does the process take, do you know?
A. I don't know definitely how long it would take with tobacco. Of course all those materials absorb moisture from the air, and it would depend upon the amount the moisture required by the tobacco, and how much moisture you put in the air and how you regulated it. I can't say just how long it would take.
Q. Will you turn to that patent on the tobacco ordering, Professor?

492 Mr. Williamson: Proctor's.

Mr. Ely: Yes, that is 553,723.

The Witness: Yes, I have it.

Q. Now, does that process take an hour or does it take five minutes or twenty minutes or how long does it take? Does it take a day?

A. Well, I would imagine, I don't know just how long, but I should imagine that it would take the better part of a day and maybe longer. There are some of these materials like tobacco and so on that must be thoroughly conditioned at the right atmosphere, and kept there a sufficient length of time to have the fibres in a certain state of moisture. Now, I can't say on tobacco just how long it would take.

The Court: Have you ever handled tobacco at all?

The Witness: Yes.

The Court: Have you ever been through a cigar factory and seen the process there?

The Witness: I haven't been in a cigar factory. I handled tobacco as a youngster on the farm.

The Court: You stripped it, did you?

The Witness: I stripped it, and we used to shed it and handle it. I have been all through that part.

The Court: Is that as far as your experience goes there?

The Witness: With tobacco, yes.

Q. Well, this ordering is giving the tobacco the same
493 amount of moisture so that it could be handled without crumbling and breaking?

A. Yes, conditioning it.

Q. In this ordering process there is no heat added, is there? A. There is none shown here, no.

Mr. Williamson: No what?

The Witness: No heat added.

Q. And there is no inlets here for the interchange of any —in other words, there is no freshening of the air in there?

A. No, there is in the—just a minute. I don't think there are in this tobacco process. I don't recollect any right now.

Q. There isn't for the purpose of drying out the tobacco, is it?

A. Not unless it is too moist. Of course if the tobacco is too wet, then you would have to dry it out, and you would have to heat it the proper condition; if you get it too wet then you have got to dry it out.

Q. Ordinarily the process is for drying the tobacco out, is it?

Mr. Williamson: Objected to as incompetent. This witness hasn't qualified on this subject.

The Court: I don't think this witness knows anything about this.

Mr. Williamson: And the evidence doesn't show that this witness has any knowledge of this because he hasn't
494 had experience with tobacco. It is as plain as the nose on his face. There is no use talking about it. Sustain the objection?

The Court: I won't receive any testimony of his as to how much moisture is necessary for the conditioning of tobacco because you don't know, do you?

The Witness: In a general way, not very much.

Mr. Williamson: You mean about the handling of tobacco.

The Court: Everybody knows if you expose tobacco to moisture it will take it up, and when it isn't exposed to moisture it gets very dry so it will crumble all to pieces and you don't know anything more about it than that, do you?

The Witness: I know nothing about how much you have got to have or how long it takes to come into it.

The Court: You know in a cigar factory the leaves are there slit, and the fibres—

The Witness: Yes.

The Court: And you don't know anything about how much moisture or just what condition it has to be.

The Witness: No, I haven't been in cigar factories, and I don't know the moisture that is necessary.

The Court: I don't think it is necessary to waste time on that.

Mr. Ely: I don't think so. It is a remote art. I
495 just wanted to bring out those facts.

Q. Suppose you had this machine of Proctor, patent 553,723 and suppose you put eggs in one side, and tobacco in the other and ran it so the tobacco was ordered, would you hatch chicks?

A. I wouldn't expect to, no. I wouldn't expect to work that combination out.

Q. And if you put eggs in the Senate Chamber and ran the Senate chamber so it was livable for the senators, would you hatch chicks in that chamber? A. No.

Q. In an ordinary house if you put eggs in an ordinary living room and kept the living room at the proper temperature, and moisture conditions for living, would you hatch eggs in that room?

A. No, probably not, too cool.

Mr. Williams: Judge Hickenlooper pointed out in his decision that his court room could be changed into an incubator by applying the proper heat and regulation.

The Court: Who did?

Mr. Williamson: Judge Hickenlooper.

The Court: Did he know how to do it?

The Witness: I would like to state, if I may, that these conditions have all been considered proper conditions for human beings, and not the possibilities. If you had asked me if it was possible to regulate that I would say yes.

Q. But the conditions and requirements for human beings and for living rooms and for senators of the United
496 States are quite different than those for egg hatching? A. Yes.

Q. In fact when we were down looking at the machines, the other day you said that you didn't run the machines at the temperature of incubation or the moisture because it wouldn't be comfortable in there for us, isn't that right?

A. Yes, but we all admitted it wouldn't make any difference so far as the operation is concerned. The principle is the same in the living room. You could regulate your temperature and have it in hatching condition, but you don't live that way.

Q. But the conditions are different as far as the requirements are concerned?

A. Well, different.

Q. That is right. Now these incubators you have cited, for instance the Bassini and Hayden patent and the Guerin patent number 300,019 and the Campbell patent, the Morgan patent, the Bell patent, the VanKeuren patent, and the Koons patent, they are all incubators of what is known as a cabinet or still air type, aren't they?

A. I will have to pick those out. I can't answer it.

Mr. Williamson: The question is objected to as hearsay, incompetent, irrelevant and immaterial, because of lack of proper identification. It is impossible to answer that question with reference to all those patents, I think in one answer.

(The question is read by the reporter.)

497 The Court: He may answer.

A. I say no.

Q. What is the exception?

A. You have asked a combination there that is hard to say, a cabinet or still air type. Those two things don't mean anything. I have got to take each thing separate.

Q. Cross the cabinet out and say still air type, are they all of the still air type?

A. I will have to get the patents together before I can tell.

Q. I think they are, preparatory to another question.

A. If you will let me take time to get these together.

Mr. Williamson: The witness is instructed he may take as much time as the Court will permit to get those patents so that he can answer the question.

Q. You want the list?

A. Give me the list. I will find them here then.

Q. I have got the patents here. I have got them all bound up in order so that you can follow them through. Bassini and Hayden. A. What is your question?

Q. The still air type.

A. The still air type. I am just trying to get a line on these patents. I don't know what they are.

Q. Well, I will show you.

A. Now, might I ask what you mean by still air
498 type? Now your first patent there, Bassini & Hayden, isn't still air. The air is passing up through the incubator. I don't know what you mean by still air.

Q. Any circulation through the machine in any of these patents is wholly by convection currents, isn't it?

Mr. Williamson: Now, that question is objected to because it is indefinite. It don't refer to any particular patent.

The Court: He is asking if it isn't so with reference to all.

Mr. Williamson: All the patents he had before him. Then I instruct the witness to take his time until he has time to look over them all. The way it is interpreted by the Court that means all of them.

Mr. Ely: Shall I ask him each one?

The Court: Yes.

Q. And the Guerin patent, that is the type in which that circulation is provided by convection currents alone, is it not?

A. That is convection currents.

Q. And there is no staged incubation described in that patent?

A. None, that is large scale, not staged.

Q. Not staged incubation?

A. Not that I recollect in that.

Q. And the Bassini & Hayden, 330,457, what are your
499 answers with regard to that?

A. Well, that is gravity circulation up through the egg trays.

Mr. Williamson: Better get the name of the patent into it or else the record won't show.

The Witness: The Bassini & Hayden patent is gravity circulation of air or other heat of the trays—of the heating elements and eggs within the incubator.

Q. That is convection currents, isn't it?

A. It is convection and gravity circulation combined. Convection and gravity are two different things, of course.

Q. And in that the eggs are all in one stage of incubation, that is right, isn't it?

A. Yes, so far as the patent described, they are.

Q. And this particular patent says, "In this way we [present] sudden chilling drafts and like abrupt variations of temperature." That is right, isn't it?

A. What does that refer to? Let's see what that refers to? Where did you get that? Of course that statement that you bring out there refers to that whole paragraph which describes the placing of the eggs between the heating coils and so on and so the statement in itself can't be considered unless I read that full paragraph.

(Adjournment taken to November 23, 1932, at 10 o'clock A. M.)

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500 November 23, 1932.
At 10 o'clock a. m.

Hearing resumed pursuant to adjournment.

Court and counsel present.

Prof. Frank B. Rowley, recalled, testified as follows:

Cross-Examination.

By Mr. Ely:

Q. Mr. Rowley, did you ever see a machine like that shown in the Schmidt Patent, Number 1,010,809, for drying macaroni; did you ever see that machine?

A. What is the number of the patent?

Q. 1,010,809; this is the macaroni drying machine?

A. No, never saw that machine, if that is your question.

Q. No; and you never built such a machine and tried it out, in a hatching way, did you? A. No.

Q. Well, that is all; I am not going to ask you any more questions on that.

A. All right.

Q. Now, referring to these tests that you made on Sunday, with the Smith incubator,—

A. (interrupting) Yes, sir.

Q. (continuing)—with the curtain removed?

Mr. Williamson: (interrupting) You mean, last Sunday?

Mr. Ely: Yes.

501 By Mr. Ely:

Q. In the Smith incubator, the air, as it comes from the fan, comes out in a cone, does it not?

A. Yes, sir.

Q. And the position at which the cone intersects the vertical sides of the corridor is where,—how far from the floor?

A. Well, in that particular case it was about,—the cone probably intersected very near the floor, but from the smoke it would appear that it intersected about two feet from the floor.

Mr. Williamson: (Interrupting) Well, you mean, without the curtains?

The Court: That is what he asked for.

Mr. Ely: I used the word "curtain."

Mr. Williamson: Now, just a minute. If you will listen to the question, you will find that the word "curtain" was not used in that question.

Q. Now, is there any difference in the point where the cone strikes the vertical plane, when the curtains were drawn, or when they were drawn back, and when they were stretched out,—is there any differnce in that point?

A. That is, you refer to the point where the cone strikes the floor?

Q. No, no; I am talking about the point where the cone strikes the vertical plane of the ends of the trays?

A. Well, I did not make a survey to find just where it
502 struck, with the curtains on; I cannot answer that.

Q. Then you don't know whether it made any difference in the formation of the cone whether the curtain was forward, or whether it was drawn back?

A. Well, I don't know from actual tests, but naturally I would expect a different condition,—for a different condition.

Q. That is all right. I did not want you to speculate on it; I asked you whether you knew.

A. Well, I have not tested it.

Q. Now, do I understand you to say that when the curtain was removed, or pulled back, that the air came back into the corridor all the way up from the bottom of the stack of trays, up to the beam?

A. You mean, clear from the floor up?

Q. Yes. A. No, I don't think I said that.

Q. Well, what did you say?

A. It is about two feet,—about at the two foot level,—around in there. It was variable across the length of the machine, of course, but somewhere around two feet, or in that level there, it was coming out into the corridor.

By the Court:

Q. Well, I don't quite understand you; do you mean on the plane of two feet from the floor?

A. Approximately that, it came in, and below that, it was going in, under that line, straight across, but it varied
503 at different places.

Q. But from that line, your testimony is that the air was coming back into the corridor all the way up to the beams?

A. Now, that was where I surveyed it, in front of the fan; it was coming out from there, flowing out from the trays into the corridor up there. Now, there might have been places up near the top some place, where it might have been the other way, but the majority of it was coming out. Of course, to arrive at that definitely, you would have to go all over these points, and make a definite survey of it.

Q. Well, did you not take one line and follow that line right straight up to the beam?

A. I went up pretty close, up to the fan; I don't know as I went clear up to the beam in there.

Q. Well, up to the level of the fan?

A. Well, practically up in there, yes. I did not survey every point as to where my,—I did not survey every point through there.

Q. No, but you did take one definite line, and followed it all the way up to the beam, didn't you?

A. Well, I moved the smoke up and down in various places through the trays.

The Court: His question is, whether or not you followed it up,—the question is, whether the beam is,—

The Witness: I followed it up substantially to the fan.

504 By the Court:

Q. I understand that the beam is the bottom of the false floor?

Mr. Ely: Yes, that is right,—up to the bottom of the false floor.

The Court: I understand the beam is the bottom of the false floor?

Mr. Ely: Yes, that is right, up to the bottom of the false floor.

A. Well, I don't know as I was up in the corner, right there at the top of the false floor; that I really can say that I actually found smoke up in that point; but I did this: I put smoke back in, about on the two foot line back,—a foot and eighteen inches or such a matter back in the tray, and that smoke there flowed up, and came under the fan, out into the corridor, under the fan, which shows the general flow there.

By Mr. Ely:

Q. That is, your understanding would be that the general flow would be down from the fan, and then back into the corridor, without going back through the fan?

A. Much of it goes that way, yes,—much of it.

Q. Now, you said "much." Now, when you had the curtains pulled back out of the way, did you notice any diminution in the amount of air that was discharged by the fan downward? A. At the fan, you mean?

Q. I asked you, did you notice any diminution in the
505 amount of air that was discharged by the fan downward?

A. Well, I took the volume or the velocity of the air at the discharging face of the fan, the average velocity.

Q. Well, did you notice any difference in the amount that was discharged from the fan downward, when the curtains were back, and when they were stretched out?

A. No, I did not; I would say that that was about the same discharge by the fan, as far as observations went.

Q. Now, the fan is fed, except for the small amount that comes in at the fresh air opening,—that fan is fed, or those fans are fed from the space between the top of the beam and the ceiling of the incubator, are they not?

A. They are, when the curtains are on there, yes.

Q. Do you know, or did you find out whether there was more or less air flowing over the tops of these beams, when the curtains were stretched out, than when they were withdrawn?

A. I did not make a test to determine that part of it; I did not go that far with the survey.

Q. You did not make that test?

A. I did not make that test, no.

Q. So that you don't know whether there is any more or less, or the same amount of air is fed into the fan from over these beams, with the curtains in the two positions?

A. I have made no tests to show that.

By the Court:

Q. Now, how would the air get to the fans except over the beams?

506 A. I would infer, of course, that what air actually passed through the fan itself would come over the beams; and that would be the same; I did not test that.

By Mr. Ely:

Q. And you noted no diminution of the amount of air, you said, that was being fed down by the fan, with the curtains in the two positions?

A. No, I did not compare that definitely.

Q. And you did not go to the trouble of checking up, to see whether that made any difference in the amount of air that went to the fan over the beams?

A. Well, that was not the object of the test; I did not make that survey.

Q. Now, you testified in your direct examination that much of the air came back into the corridor, and yet you did not test whether there was any diminution in the amount of the air that went over the beams into the fans? A. No.

Q. Would it surprise you to learn that just as much air goes over the beams into the fans with the curtains withdrawn, as with the curtains in place?

A. No, that would not surprise me, if that is the only place that it could get in there.

Q. Yes. As a matter of fact, a little more goes over the beams with the curtains withdrawn?

A. I do not know that.

Q. You do not know that; you did not test that?

507 A. I did not test that.

Q. And yet you told the Court, or you pretended to tell the Court about the traveling of the air, even though you did not test that very obvious fact as to the amount of air which was going down,—

The Court: (interrupting) Well, I think that same question has been answered over and over again.

Mr. Williamson: Give the witness a chance to answer the question.

Mr. Ely: Well, I will withdraw that question.

The Court: I think that question is mere repetition.

The Witness: I feel so; I tried to tell you, Your Honor, just what I did and what happened.

By Mr. Ely:

Q. Now, Professor Rowley, will you just get your original sheet that you made your notes on at the time you took the tests down on Third Street here; will you get that original sheet?

Mr. Williamson: The tests of what machine?

Mr. Ely: The tests of the Snow machine down there.

A. What exhibit is that; I don't know?

By Mr. Ely:

Q. I want your original one, the one that you made the notes on when you were down there.

Mr. Ralph E. Williamson, Jr.: That is Defendant's Exhibit M; here it is (indicating).

By Mr. Ely:

Q. I think you have an error in your copy that you

508 gave me, and I wanted to see if I were right, or whether you were right. Your marks differ a little from mine, and I want to check that up with you, just for a minute.

Mr. Ralph E. Williamson: Here they are. (Documents submitted.)

By Mr. Ely:

Q. What I want particularly is that section on the line BB, that is, through the center plane of the trays on the left hand side?

A. BB,—all right.

The Court: What page are you on?

Mr. Ely: Well, this says "Diagram Number 2;" it is the section line BB.

A. I have it here (indicating).

By Mr. Ely:

Q. Now, will you look at this point on the right hand fan, between the columns 8 and 9, and on the center line down; what have you got there, Professor?

A. On the center line, out and down?

Q. Well, between 8 and 9? A. Yes.

Q. Between 8 and 9, and then on this line, just immediately above the center of the fan; do you find that place?

A. Well, I have got "IRD" here.

Q. Well, that is what I thought, because in the drawing,—

The Court: (interrupting) I don't see where that is; I have got "IRO."

The Witness: Well, that is in the copy, and that copy
509 is wrong.

The Court: It should be "D."

Mr. Ely: Yes, that is what I had.

The Witness: Capital letter "D."

By Mr. Ely:

Q. It should be "IRD," that is in, rear and down?

A. Yes, that is right; this is the original that I have here.

Q. Now, Professor Rowley, taking a current of air,—a current of air is what is known as a critical speed, isn't it; are you familiar with that term, or is that a correct term?

A. I don't know how you would apply the term "critical speed" to a current of air, unless you were talking about vibration, or something like that.

Q. Well, is there a point in the speed,—is there a point in the speed, in the travel of a current of air beyond which it becomes turbulent; in other words, when does a current of air become turbulent,—at what speed?

A. Well, you cannot specify that speed. It depends entirely on the conditions,—as to starting a current of air, and how it is delivered. There is no place that I can define, as to where it becomes turbulent.

By the Court:

Q. I suppose, that at a certain speed, it becomes turbulent?

A. Not necessarily; it depends on how these stream lines are started at the beginning of the current.

By Mr. Ely:

Q. Suppose you project a current of air from the fan,
510 —can you project a current of air from the fan at a speed so that it will not be turbulent?

A. Well, you can, if I understand your question right. I would expect it would have a general movement forward, with some turbulence in the fan, if it is from the fan.

Q. Yes. That is, any current projected by the fan will be more or less turbulent, that is right, isn't it?

A. Well, you could not say any current from any fan, because you can create a current and deliver it from a nozzle, with a properly rounded nozzle or orifice, so that it won't become turbulent, as it is when it is delivered from a fan.

Q. At what speed would you have to deliver a current of air from a nozzle,—what is the limit of speed at which it would become turbulent?

A. Well, I could not define, or give you right offhand any limit of speed at which it will become turbulent; there are many factors that affect that.

Q. That is, the speed of air current delivered from a fan, say, propelling the air at 800 feet per minute, that would be turbulent, wouldn't it?

A. If you deliver it from the fan directly, to the blades, there would be some turbulence in the stream itself, yes.

Q. But in any of the speeds of the fan that we are dealing with here, in these incubator structures, the speed of the air is sufficiently fast so that the currents are turbulent, that is true, isn't it?

511 A. Well, you are confusing the reasons for the turbulence. Of course, I will admit, that within the stream there is some turbulence, yes, but you are confusing your terms there.

Mr. Williamson: Speak a little louder, Professor.

By Mr. Ely:

Q. Well, in any of the air speeds that we have been dealing with, in discussing these currents of air in the machines,

the air is turbulent; although it is moving in a stream, yet, it is turbulent within that stream, that is correct, is it not?

The Court: You mean by turbulent, that it tumbles?

Mr. Ely: Boiling, tumbles, stirred up.

A. Will you repeat that question, please?

(Previous question read by the reporter.)

A. Well, it is not a question of the speed that we have been dealing with. Now, I want to make one point clear.

By Mr. Ely:

Q. No, never mind.

Mr. Williamson: Let him finish his answer, please.

By Mr. Ely:

Q. I think you can answer my question.

Mr. Williamson: He is answering it; let him finish his answer.

The Court: Well, let him take his own way in answering it.

A. There are certain places, for instance, if we refer to the incubator, either one of the incubators,—there are certain places, such as those spaces underneath the hatching trays, and such as the delivery of air, or cone, as you
512 might call it, from the Smith fan, in which there are air currents, which are sufficiently straight to consider measuring them by that method, by the anemometer, but there are other places where the are movements in the open, for which the anemometer may not show direction at all. Now, I want to make that clear.

By Mr. Ely:

Q. Well, the trouble of it is that you don't answer my question.

Mr. Wiliamson: If Your Honor please, the witness should be permitted to finish his answer.

The Court: I think he has finished it.

A. Yes, I think I have made it clear; I want to make the answer clear.

The Court: Go ahead, and answer it.

By Mr. Ely:

Q. Now, has an air current any other movement with it,—an air current has a tendency to whip, has it not?

A. Well, it depends on what you mean by whipping, and what you mean by an air current. An air current might have a perfectly smooth flow for a ways.

Q. But if it goes beyond that, to a certain speed, it will tend to whip, will it not?

A. The speed has nothing to do with the whipping movement.

Q. Don't you notice that in a fan,—in a flag flying on a windy day, that it whips?

A. Well, these currents out there in the open are entirely different from what we are talking about here; that is, there is this difference: You are trying to define directed
513 current, and say that the velocity of the speed makes that vhip. Now, it is not the speed up there that makes the flag whip.

By the Court:

Q. What is it that makes it whip?

A. Well, it is the general agitation of the open currents there. If you had an even velocity there, that is, smooth, absolutely smooth, even then, of course, you would have wrinkles in there; there would be a little bit in there. And we know that even though the wind is blowing in a certain direction, with a large volume of air that way, you have an up and down current and a cross current.

Q. That is to say, the whipping and turbulence is a characteristic of all air currents, is it not?

A. No, sir, it is not.

Q. That is to say, you think you can have an ideal air current?

A. You can get the same air current delivered from a nozzle, or a rounded orifice, which are nearly perfect.

Q. But where the air current is flowing in a room, you have a certain amount of whipping and turbulence in the air current?

A. In the air current in a room, you have diffusion, if you want to call it that.

Q. Yes. Now, which is more uniform,—which is more even and uniform throughout, an induced current or a forced current?

514 The Court: What do you mean?

By Mr. Ely:

Q. By an induced current, I mean one, for instance, in a fan, the current which is either driven into the fan, or the one which is discharged on the opposite side of the fan?

A. Well, if you make your question read the induced or the forced current, I don't think you could distinguish between the two; you would have to designate the method of inducing or forcing the current. If the method of forcing the current was one which stirred up the air, and the method of supplying the air to that forcing apparatus was stream-line and smooth, then, you would have some turbulence on the discharging end of the fan.

Q. And the current, coming to the fan from the intake end, then, would be more even and uniform than that which it discharges, is that what you mean?

A. They might not be; you might have them just the opposite way; it depends on the circumstances surrounding the air-flow.

Q. That is to say, if you take the ordinary fan, such as we have on the wall, the current is even and uniform,—more even and uniform as it comes into the in-take side of the fan than it is as it is discharged from the other side of the fan; that is true, is it not?

A. Well, it depends entirely on the surrounding conditions of the fan. You might have it either way. Naturally,
515 your fan tends to stir up the air when it goes through.

Q. That is, you have observed that because you saw a stream of smoke flowing into the fan, and then it comes out, and it is all broken up on the other side, and all stirred up, that is correct, is it not?

A. If you confine it to that particular case where that stream is passing through, of course, your mixture is more apparent as it passes through, but you have also got a much higher velocity as it passes through.

Q. Now, in your opinion, is the Smith commercial machine,—does that embody the method generally in the Smith Patents?

A. Well, the Smith commercial machine,—if you are talking about the disclosure in the Smith Patents,—the difference there is that in the Smith commercial machine the so-called canvas flaps between those tiers of eggs are omitted, and the air circulates more up through between the tiers than it does through the eggs in these lower trays. That is one difference. Then, of course, there are other differences there.

By Mr. Ely:

Q. Do you think that deprives the Smith commercial machine of the benefit of the Smith invention, or the Smith method, described in the Smith Patent?

Mr. Williamson: If that is confined to the disclosure, I make no objection, but if he is talking about the invention, I object to it.

Mr. Ely: Well, I have changed it.

516 A. Now, will you read the question, please?

(Previous question read by the reporter.)

Mr. Williamson: I object to the question the way it stands.

The Court: Well, you can reframe your question.

Mr. Williamson: Well, let us get the reframed question on the record.

Mr. Ely: Well, I have stricken out the word "invention."

The Court: Ignore the word "invention."

Mr. Ralph E. Williamson: Read the question as it now stands on the record.

(Previous question read—omitting the word "invention.")

A. Yes.

By Mr. Ely:

Q. You think the omission of these flaps upsets the whole process of the Smith Patent?

A. Well, it deprives them of the benefits that they are trying to get, because the benefit that they are trying to get is to circulate this air definitely up through those lower hotter trays of eggs, or around the trays. Now, we know, that if you take those flaps out, the air could not be forced through those eggs in the lower trays with any velocity that will give you any benefit more than still air, and that is what you are looking for in your Smith Patent or Smith specification.

Q. Do I understand that in your opinion these flaps
517 between the trays are the essential thing of the Smith Patent?

A. Well, I don't say that they are essential, but I say, that if you take them out, you certainly deprive the Smith system of the thing that they are trying to get.

Q. Then you don't think that the commercial machine uses the Smith method described in the Smith Patent, that that is not carried out in the commercial Smith machine?

A. Well, it is not carried out to the same degree.

Q. That is to say, it is a refinement, is that right?

A. It is more than just a refinement; it is not carried out to the same degree; you cannot force that air with any velocity over these lower hot eggs, unless you confine the current, and make it go over, unless there is a high resistance in a small area, and it stands to reason that it would not get

through there, and all the testimony and all the tests that have been made show that it would not get through there.

Q. Have you made any tests with the machine, with the flaps between the columns of trays?

A. No.

Q. Now, in the Smith commercial machine, the bulk of the air flows up between, in the columns between the egg trays, does it not?

A. Between the tiers, you mean?

Q. Yes.

A. On the outside?

Q. Yes.

A. Yes.

518 Mr. Williamson: Is that the commercial machine?

Mr. Ely: Yes.

A. Yes, I might of course say that as to around the ends of the egg trays and other places, but you are confining this to the section through the trays, I understand?

Q. Yes, it goes up through the columns.

A. If we take a section through the trays, yes.

Q. And then, in the Smith machine, you have a plurality of parallel currents over the whole extent of the machine, do you not?

A. Well, you might say that you have a plurality of columns moving up there between those tiers.

Q. Well, it is a plurality of parallel currents, is it not?

A. It depends on what you call a current or movement of air,—are parallel with what?

Q. That is, it moves steadily up through, or it moves constantly up through those passageways or vertical passageways?

A. As far as I know, it does; I don't know, you understand,—

Q. (interrupting) They are moving consistently.

A. Well, I could not say that it is consistent, even.

Q. It is always moving in the same direction?

A. I cannot say that it is moving in the same direction.

Q. You don't know?

A. Well, it has got to turn some place, to get over towards the fan; it certainly cannot move up from the

519 floor to the top all the way.

Q. I am talking about this movement between the columns of egg trays.

A. I am, too.

Q. And you do not know whether those currents of air go up through these columns all the way, do they not?

A. Well, they go in, up to the ceiling, straight up; otherwise, they will never get to the fan.

Q. That is, between the columns of trays, this air moves up in a column form, right straight up, through the columns, does it not?

A. Well, I have answered that, I think, but I will answer it again, if you want me to.

Q. Well, I think you have carried the thing clear up to the ceiling, and I want to ask you the direct question,—

The Court: (interrupting) The point is this: These columns that go clear up to the ceiling,—he is asking you if the air moves up to the top of the column.

Mr. Williamson: (interrupting) To the top of the ceiling.

The Court: No.

Mr. Williamson: To the top of what?

The Court: Well, these columns between the trays do not go to the ceiling, do they; how close to the ceiling do they go?

The Witness: Oh, I suppose it is a foot, or something
520 like that, in there.

The Court: Well, he is asking you whether the air moves consistently up in that column of air, through this space between the trays, up to the top.

The Witness: I would say that it does not move consistently clear to the top, no. What you mean by that is, in a straight column, moving generally up, in a straight line.

By Mr. Ely:

Q. Now, will you take your diagrams of the Snow machine, please, and take that sheet that I called your attention to this morning, and that sectional line BB; will you please take that?

A. (Witness does so.) By that, do you mean of the Snow machine,—which one do you mean?

Q. The vertical section, taken on the line BB?

A. Well, do you mean,—

Q. (interrupting) Well, I have given it your own name.

A. I have got it here (indicating).

Mr. Ely: This is it (indicating).

The Court: Where do you get the BB?

Mr. Ely: Well, BB is the center line.

By Mr. Ely:

Q. Go ahead, Professor, and explain what BB is.

Mr. Ralph E. Williamson: (interrupting) Right here (indicating).

The Court: Oh, yes; it is right here.

By Mr. Ely:

Q. Now, when you use a combination of letters like,
521 say, take, for instance, the top of the incubator, right underneath the ceiling, where you had letter "O," that means out, doesn't it? A. Yes, sir.

Q. That means straight out?

A. Yes, sir.

Q. Now, when you have got "OF," you mean by that a diagonal line which goes out, and towards the front?

A. Some place between out and towards the front. There might also have been some slight down movement; but that was the predominant movement.

Q. But, "out front" means a diagonal current going over towards the door?

A. Some place in that quadrant.

Q. And when you say "in," or "I," that means straight in, that is right, isn't it?

A. Substantially; it might be moving a little bit close to in.

Q. It might be veering a little bit?

A. It might be traveling around, but it is substantially moving in that direction.

Q. And when you say "IF," it means that it is moving in a diagonal direction into the fan, towards the door, that is right, isn't it,—towards the front?

A. "IF?"

Q. Yes. A. Yes.

522 Q. And when it is "IR," that means it is moving in and toward the rear in a diagonal direction?

A. Yes, sir.

Q. And "ID" means that it is moving in and moving down, toward the floor, in a diagonal direction?

A. Yes, sir.

Q. Now, will you take that section on the right, the section between the lines 7 and 12, and take it across that first, —well, the line between the third and the fourth trays; do you see what I mean?

A. I think I do, yes.

Q. Now, between 7 and 12, and these lines (indicating), that cross the third and fourth trays (indicating)?

A. Yes, sir.

Q. And also take the vertical column between 7 and 8; consider those two lines, will you, please?

A. (Witness indicating on chart.)

Q. Now, you have an in, a direct in on the line that crosses the third and fourth trays, and then you have an in on the line, the next lower line, that is right, isn't it?

A. You mean the next horizontal line?

Q. Yes, directly below.

A. Yes, if I understand you correctly.

Q. And it is fair to assume, isn't it, that the current in between those two points is also going in, is it not?

A. Probably; there might be some other current, but
523 that would be the way I take it from any data given here.

Q. And so on, down to the next one,—you have got another in, so that the current between the second and third trays is moving straight in?

The Court: That means, in from the corridor?

Mr. Ely: Yes.

By Mr. Ely:

Q. That is, between "I," the current is assumed to be moving in?

A. Well, of course, you must remember that if we are beginning to take in other points there, that have not been actually shown here, they are very close to the downward moving current, too; there might be eddy currents of all kinds here; that is shown by the downward current, right at the left.

Q. (interrupting) Just a minute. I am asking you to look at this place here (indicating).

A. Yes.

Mr. Williamson: If Your Honor please, I insist that the witness must be permitted to answer the question without being interrupted.

The Court: Yes, and he also should be definite in his answers. He is on cross-examination here, and he should be held to answer each particular question definitely.

Mr. Williamson: Yes, as practically as he can.

By Mr. Ely:

Q. Now, following that horizontal line over, or across the third and fourth trays, you have "ins" right straight across, do you not?

524 A. Yes.

Q. And it is fair to assume that the current in between those spots that you have got marked here, are going in, isn't it?

A. You would naturally assume that, yes.

Q. And you would also assume that from the fact that that is directly in front of the fan, and the current is going in through the fan?

A. Yes, the general direction there would be inward, at that point.

Q. And then, in the line that is immediately below that line, the next horizontal line, should be one, two, three, four ins; that is correct, isn't it?

A. Which lines are you talking about now?

Q. The next lower line, the one that crosses the sixth and seventh trays.

A. I only see,—you said I had how many there?

Q. Four ins.

A. Oh, they are not four in-lines, are they?

Q. Yes, "I," "I," "I," "I."

A. Well, are you talking about the line just above the center of the fan?

Q. I said four of these lines, one, two, three, four.

The Court: There is one in between there.

By Mr. Ely:

Q. Yes. The one in between is "IRD;" that is a diagonal current in, rear and down; that is toward the eye
525 of the fan, isn't it?

A. In, rear and down, yes.

Q. And, now, take the next line down, and in the next horizontal line below, the current is consistently in, all the way down?

A. Well, it is for the point right in the plane of the fan, but when you get out to the right hand side,—to the left hand side, then it is out.

Q. No, but I have not finished my question,—to the rear, between lines 7 and 9?

A. Oh, you asked me about the figures on the line, as I understood you.

Q. Well, I meant to finish my question,—to the rear, between lines 7 and 12; now, in that line, those are consistent ins, aren't they?

A. Between 7 and 12, those are in.

Q. Now, take the next lower line, that is, between 8 and 9, in and rear, that is right, isn't it?

A. In and rear, yes, sir.

Q. That means that that is a diagonal line going towards the center plane of the fan?

A. In a general direction, yes.

Q. And the next two are in and up, showing that that is a diagonal line which veers off toward the center of the fan a little bit, that is right, isn't it?

A. Yes, sir.

526 Q. And then, further, at the far corner, you have got a straight in?

A. (No answer.)

Q. That is right, isn't it?

A. Oh, between these, you have got an in and up, which you mean here (indicating)?

Q. No, I said there are two ins and up, but that is toward the fan? A. (No answer.)

Q. That is to say, in the rear, if there is any divergence from the direct in-line, that is towards the center of the fan slightly, it is toward the center of the fan slightly, that is right, isn't it?

A. That is it in general, yes.

Q. Now, taking that same section, we find that you have out currents all over the ceiling of the machine, coming out, that is right, isn't it?

A. Well, if you are confining yourself between 7 and 12, as I understand it.

Q. Yes, that is right, isn't it?

A. They are out and front.

Q. Well, they are out currents?

Mr. Williamson: His question reads "all over the machine," if I remember right.

The Court: No, it is plainly defined, as between 8 and 12.

527 Mr. Williamson: Certainly, I will withdraw my objection.

The Court: And the witness so understood it.

The Witness: Yes, I think I answered it that way, yes.

The Court: Yes, you did.

By Mr. Ely:

Q. Now, the same general condition is true of each area in front of the fan, isn't it,—each of the four areas?

A. Well, your same general condition might be true. In this particular case, you would find quite a little difference, if you analyze the two conditions. You have taken one agitator

here, and analyzed a specific point in that one. Now, if you are asking me to answer that general question, I might refer you to the second line down, between trays three and four, and move over to the left hand side.

Q. Where do you mean now?

A. Moving over there to the left hand side, where you have shown in your analysis here five points in, I think, and when we get over to the corresponding place on the left, we find that there is only one point in there. That point I read as flow coming across on that line, for the other agitators, "IDR," "IDR," "I," "IDF," and "IF." Now, you are asking me to state in general that that corresponds to the other side, in which there are five "I's." Now, of course, you have picked out a special case in here to analyze, and
528 that shows that you cannot compare that to any other special case.

Q. Of course, you have got the directions wholly by eye, didn't you? A. Yes, by watching the smoke.

Q. Now, we will take that second section first,—that section on the other side; let us analyze that. As a matter of fact, in each case where there is a variation or a veering from the direct in, that is a veering toward the center of the fan, is that right?

A. That seems to be right, yes.

The Court: Is that "IDF," as going toward the center of the fan?

By Mr. Ely:

Q. This is it here (indicating).

A. Yes, sir.

Q. In other words, you have got a sort of a cone formation of the air, which moves into the fan, isn't that right?

A. Well, of course, you probably have, as far as the velocity is concerned; you have got a higher velocity right at the eye of the fan, that is, in line with the eye of the fan,—there is probably a higher velocity out towards the fan than there is in towards the rear that you are talking about.

Q. Yes, but my statement is substantially correct, that you have substantially a cone formation going into the fan, isn't that right?

A. Well, you are talking about velocity; there is a higher velocity.

529 Q. Now, will you answer the question, please?

The Court: A drift of air?

The Witness: If you call it a drift of air, that is towards the fan, yes.

By Mr. Ely:

Q. Well, if it is the same as a drift, it is a positive movement, isn't it?

A. It is a movement towards the fan.

Q. It is in a general cone, isn't that right?

A. Well, I don't see that you can call it all over a general cone; you have taken two special cases here, and these that you have analyzed here, I would say that it is generally in, and where there is a difference, it shows toward the eye of the fan.

Q. I thought you would probably say that, so I save the best one for you after you made that remark. Now, will you take your section on the line DD.

The Court: Line DD; that is right up in here (indicating)?

Mr. Ely: Yes, that is through the center line on the other side (indicating).

By Mr. Ely:

Q. Now, take that area in front of the fan, on the right, and this time we will take between the lines 6 and 1, that is in front, right at the door? A. Yes.

Q. Now, will you take the line that crosses the trays, immediately above the center line of the fan, and will you
530 read me what you have?

A. In the line immediately above, between six?

Q. That horizontal line.

A. Between tiers six and one?

Q. Yes. A. I have here five "I's."

Q. That is in, right straight across, isn't it?

A. Yes, sir.

Q. Now, take the next line below that line; what have you got there?

A. Below that I have one "IF," and four "I's."

Q. That is, they are all in, except over there at the edge of the fan, that is right, is it?

A. Yes, sir.

Q. And that direction is in, front, that is, a general veering off toward the center of the fan, isn't it?

A. Yes, sir.

Q. Now, take the next line down, the one immediately above the hatching trays, what have you got there?

A. I have got two "IF's," and three "I's."

Q. That is, the two "IF's," that is veering off toward the center of the fan, isn't it?

A. Toward the center plane there, yes.

Q. Now, take the horizontal that crosses the fourth and fifth trays; what have you got there; and, in that case, go clear over to the line immediately at the center,—
531 starting over there, in that case?

A. Starting over at 7, do you mean?

Q. Between 6 and 7.

A. You mean, you want me to read that in all through here (indicating)?

Q. Yes, I want you to include all that area.

A. In that case, I am reading from left to right, starting between 6 and 7, "I," "IF," "I," "I," "I," "I," and "OU."

Q. No, no; pardon me, you went too far; I did not ask you to go beyond one.

A. Well, I went clear across.

Q. Well, I am confining my question to, between 1 and 6.

Mr. Williamson: The witness ought to be permitted to answer the question.

The Court: Well, gentlemen, I understand both of them, as to what they want, and what he says.

Mr. Williamson: But he stopped him before he was through.

The Court: No, he did not; he said "Over here by the wall it was 'OU,' " out and up.

The Witness: Yes.

The Court: But the question that you are trying to confine him to is, between those other lines.

The Witness: I think the first question was confining it between 6 and 1, to start with.

By Mr. Ely:

Q. All right. Now, take the top line, immediately be-
532 low the bottom; what have you there?

A. Where do you want me to start from?

Q. From between 6 and 7, and go between 1 and 2.

A. I give it as four "IF's," one "IR," and one "I".

Q. Yes. That is, the general direction of this is forward, except that it might vary slightly toward the center of the fan, and there is one slight exception, and that is the middle "IF."

A. I don't know if I got that question right.

Q. Well, what I am getting at is: It is in and forward, until you come to the center line of the fan, and then it is in-rear, that is right, isn't it?

A. No, mine is "IF," if I am reading the right one.

Q. Well, I said if you get to the center,—when you pass the center line, it becomes in-rear?

A. Yes, when you pass the center line.

Q. That is a general cone formation, is it not; that is due to the general cone formation of the air as it is drawn to the fan?

A. Well, I don't know that I would say that. It is drawn toward the fan,—practically all toward there; I cannot say that there was a general cone formation there.

Q. Well, wherever there is a variance from the direct in, it is always toward the center of the fan, is it not?

A. Yes, in general, yes.

Q. Now, this current that is coming in toward the fan
533 is coming from some place, isn't it?

A. Yes, sir.

Q. And it is coming from the current that is moving out along the ceiling, the side walls and the floor, isn't it, principally?

A. I would not say that it is coming from the current in there, because there are all kinds of different currents there; it is coming from that general agitated air in the chambers.

Q. And that air from the chamber comes out as a current around the entire walls and ceiling and floor of the incubator, isn't that right?

A. Well, it comes out somewhat around there, but there is some places where it goes in on the floor.

Q. That is due, isn't it, to the current which comes from the other fan, and cuts across, as we saw in the smoke test the other day, where there was an "in" there?

A. I cannot say what any one of these currents would do; there are so many different forces going on in here,—so as to confine a current like that to any one cause, or any one force.

Q. Don't you think you could tell where that current came from?

A. Well, I would have to make a pretty careful study of that, I think.

Q. Well, if you made a study, you could find out,
534 couldn't you?

A. Well, if I were to run these agitators at a different speed, and under different conditions, I would probably find certain places where I could state definitely or fairly definitely where the general flow of air is, that is, it might change with different speeds, and different conditions in there, because it is general agitation.

Q. But if the fans are kept moving at a constant speed all the time, the conditions will be the same in there, and the air movement will be the same at all times, isn't that right?

A. Well, no; you have the turning of the egg trays; when you turn these egg trays, it makes a difference in the way,—the turning of the egg trays would make a difference in the flow. These egg trays are turned at different angles, at different times, and every time that you turn one of these egg trays, or a whole side of them, you change your eddy currents, or mixing currents, whatever you want to call it, in that chamber.

Q. Did you ever try it, to find out how much difference that made?

A. No.

Q. So you don't know whether it really makes any difference or not, from an actual test?

A. Not from actual tests, but I know from experience.

Q. All right. Now, in that area, where the two fans
535 meet in the center of the machine, there is an out current, isn't there?

A. Which door are you referring to?

Q. Door 1,—we will take these sections DD.

A. Section DD?

Mr. Williamson: Are you referring to the fans on the opposite side, or the two on the same side?

By Mr. Ely:

Q. I think the Professor understands the question.

A. I think I understand the question, yes. Your question was, that there was an out current?

Q. Yes.

A. All right. I will start on that line, and read from the top to the bottom, in order to answer that.

Q. Yes.

A. Starting at the top, I find "UR;" at the next line I find "IF."

Q. (Interrupting): Just a minute. I don't think that you and I are going in the same place.

A. Well, I have got DD, from the top to the bottom, down here (indicating).

Q. Oh, I see; right there (indicating)?

A. That is what you asked me for. Starting at the top, and reading down, in answering that question, between 7 and 6, on the vertical line,—starting at the top down, it is "UR," "IF," "I," "I Mix," "O," "O;" that is all I have.

536 Q. All right. Now, will you take, and start at the bottom of 7 and 6 there; you have an "O" immediately above the hatching tray?

A. Yes, sir.

Q. And the next line above, you have an "O?"

A. Yes, sir.

Q. Now, move over slightly to the left, and take the second line, you have an "OU," don't you?

A. To the left, I don't see it.

Q. To the left, yes.

A. Which line do you mean?

Q. The cross line, that goes to "OU."

The Court: You mean up here (indicating)?

Mr. Ely: Yes.

A. Will you state the question, please?

Q. What I am getting at is that you have got an "out" between 7 and 8.

Mr. Williamson: If Your Honor please, the question ought to be read to the witness; it has been modified; what is the question?

A. I would like to know definitely what you are asking, and I will answer it.

By Mr. Ely:

Q. Well, never mind.

Mr. Williamson: I think the witness ought to be asked a perfectly clear question.

Mr. Ely: Well, never mind; I will withdraw it.

537 The Court: Well, that question is withdrawn.

By Mr. Ely:

Q. Now, from your studies of that motion, is it not a fact that the current, the movement of the two fans, as they meet, generates a narrow band of out-current, which comes out in the two,—between the two areas, fed by the fan, isn't that right?

A. Well, it is more or less mixed in there. Now, there is probably a predominance of out, but here we find,—in this one that we are referring to, there is really more in than there is out; I mean, in that other drawing, that diagram C, section C.

Q. No, no; I am asking you about DD.

A. I think you asked me about the general condition between the fans.

Q. No, I am asking you,—

Mr. Williamson (interrupting): I ask that the question be read. The witness was not permitted to finish his answer; Mr. Ely goes on, and asks him something else.

The Court: Well, the witness did not say anything; go ahead, and answer that.

The Witness: I understand that the question as to that applies between the fans, or agitators in general?

By Mr. Ely:

Q. Yes.

A. That is what I am trying to say.

Q. Go ahead.

A. Now, that line on section DD, I have already answered.

538

Q. Yes.

A. (Continuing): —because that is more out,—or it is more in than it is out, as far as the letters are concerned,—shows.

Now, taking the opposite side BB,—

Q. (interrupting): All right. What about BB?

A. There, reading from the top down, I find, starting at the top, "OF," "IU," "O," "O," "O."

By Mr. Ralph E. Williamson:

Q. What diagram are you referring to?

A. That is section BB, test diagram 2,—test diagram 2, data taken on the line BB, test diagram 1.

Now, next, on test diagram 2, data taken on line AA, diagram 1, and up in the upper right hand corner it is marked "Sheet 1" (indicating). In reading off from that diagram, from the top down, I only have three readings at the center, "ID."

By the Court:

Q. This one is "IOD" here.

A. No, that is "ID;" it is "ID," "O," "OF;" it is right here at the same drawing,—with only three figures on there.

Next, I take this diagram 3, sheet 1, data taken on line CC, that big one.

By Mr. Ely:

Q. That is the central corridor?

A. Yes, sir.
Q. Where is that, in front of the trays?
A. That is in front of the tray CC.
539 Q. That is in the corridor in front of the trays?
A. It is right down by the plane in front of the trays; it is shown very clearly on the test diagram 1, where it is taken. On the same line, through there, I have three figures, "IF," "I," and "Mix;" those are on the central portion. That is all that I have on that particular line.
Q. That would indicate, would it not, that in-out current?
A. I am not sure that my answer,—
Q. (interrupting): Pardon me; that would indicate,—

Mr. Williamson (interrupting): I think the witness should be permitted to answer the question.

The Court: Let him finish his answer, and then you can come back to it.

Mr. Ely: All right.

A. Now, the test diagram number 2, sheet number 2, which is marked "center" there, the corridor looking left,—reading from the top down, I find "IDM,"—"M" is mix. Below that, in the next line, "Mix Down." Below that, the next line, is "DF." The next line is "OF;" the next line is "ODF;" the next one is "Mix horizontal," and down below in the lower compartment is "I." On the left side, the space under the hatching tray,—

By the Court:
Q. That is what?
A. Down the center line, looking left.

By Mr. Ely:
Q. Is it not a fact, Professor Rowley, that at the gen-
540 eral plane, where the two fans intersect, or come together, there is an outward current, which moves out among the trays, and gradually fades, but part of it persists and goes out to the front of the trays, that is to say, if that current goes out through that area and turns back, it turns back into the current going into the fan?

Mr. Williamson: I ask that the question be amended, so as to make it clear whether he means two fans on one side of the machine, or two fans one on each of the opposite sides of the machine. There are two fans on each of the opposite sides of the machine.

The Court: Well, the question was not quite clear to me.

Mr. Ely: All right, I will put it in a different way, then.

By Mr. Ely:

Q. Take the two fans on one side wall; is it not a fact that in the area where the two fans come together there is an outward current that comes out at that point and gradually veers and comes back into the fan, isn't that so?

A. I cannot say that there is an outward current. There is an area in there where the air is agitated, as you know, and it goes in and out, as shown by this data. You can find places where it might go outward and it might go inward; it goes both places.

Q. Now, I have colored these two diagrams of yours,
541 the test line DD, that is on one side of the machine, and the test line BB is on the other side of the machine, in red and blue?

Mr. Williamson: You mean your copies?

Mr. Ely: Yes.

Mr. Williamson: We would prefer the one that was put in evidence.

By Mr. Ely:

Q. And I have put the red over the place where the current is in, and I have put the blue over the place where the current is out. Will you please examine those (documents submitted to the witness), and see if I have done it correctly?

Mr. Williamson: I object to the form of the question. This is not the testimony by Mr. Ely.

The Court: The objection is overruled.

Mr. Williamson: Exception.

A. That is, you mean that you have just shown the shaded area in here, for which you have taken two of these test diagrams, and you have colored around this section where it is marked mostly in?

Q. Where it is marked in,—where there is any in, yes.

A. Wherever there is an in, it is shown with red, regardless of what the other letters might be there.

Q. We have there a diagonal current that was in toward the center of the fan, as an in-current, if that is what you mean, then?

542 A. You have neglected it,—

Mr. Williamson: (interrupting) Mr. Ely, will you stay away from the witness; you are right up against his face, and it is very embarrassing to him.

By Mr. Ely:

Q. Every area that I have colored there with red is "in," toward the fan, is it not?

A. It is "I" and sometimes there are other numerals on here.

Q. Will you please answer my question?

The Court: Well, what do you mean, that that covers not only the "in," and which are directly "in," but it covers in, down, and in, right, and in-front?

The Witness: Yes.

Mr. Williamson: Now, if Your Honor please, if the question was put,—if Mr. Ely represents it that way, that would be one thing.

The Court: Well, this is a colored diagram, and he is asking him about coloring the diagram.

Mr. Williamson: Well, it is only his representation of it.

The Court: Certainly.

By Mr. Ely:

Q. That is correct, isn't it?

A. I think I answered it by stating that this shaded area here, as I understand it, that covers all of the points where there is an "I" in that point. If there is any other,—there may be other letters in with these "I's," of course, that are in the red shaded area.

543 Q. Yes, and this covers all of the current that goes toward the fan,—going in?

Mr. Williamson: I object to that,—I object to these sheets as incompetent; this witness did not make them. If he put that in,—

The Court: (interrupting) Just a moment. What you mean is that it covers that diagram where the diagram showed the area going toward the fan?

Mr. Ely: Yes, that is right.

A. I think you have got these all marked up, of the "I's," in red.

By Mr. Ely:

Q. Now, will you compare this diagram of yours, that I have colored red, with Mr. Taggart's diagram, Exhibit 13-CC, and state whether or not,—or whether they are in substantial conformity as to the areas indicated in red, flowing in toward the fan?

Mr. Williamson: Do you want to identify his in the question?

A. Well, the two diagrams show some red areas, one on each side, but they are different in shape.

By Mr. Ely:

Q. Are they not substantially the same?

A. Why, I suppose there are two red spots there; they are certainly different outlines.

Q. Are they not substantially the same outlines, Mr. Rowley?

A. Well, they are, as you might see; that would de-
544 pend on how close you want to compare them.

Q. Well, now, I said substantially the same?

A. They are different in shape, of course; they are in different relative positions, the blue and the red and the white, but the two red areas on each diagram,—

Mr. Williamson: (interrupting) On which diagram?

A. There are two red areas on each diagram.

By Mr. Ely:

Q. Well, are not these red areas substantially the same, to a certain extent?

A. Well, I could not say that they are of the same shape.

The Court: Well, of course, this diagram almost answers that question.

Mr. Ely: Well, I want it on the record.

Mr. Williamson: We did not put any colored diagrams in evidence.

By Mr. Ely:

Q. Aren't they substantially the same?

A. You have taken these test sheets and colored them up, showing these points to represent the same thing that you represented on the other, I suppose, but which areas are not the same, and, furthermore, your white areas on the two diagrams are entirely different, as shown along the base line (indicating).

Q. Are not the blue areas indicating the out-currents substantially the same?

A. Well, they run across the same general portion of the machine, at the top and the sides. The line through
545 the vertical center, however, is not the same.

By the Court:

Q. The blue line?

A. The blue line through the vertical center is not the same.

By Mr. Ely:

Q. Is it not a true statement that they are substantially the same; that is, there are some slight variations, but they are substantially the same?

A. Well, if I have to describe what I mean by the same, I don't think they are substaintially the same; it depends on what you mean by substantially the same. I think the diagrams are there, and they speak for themselves.

Q. Now, a variation might be affected by the fact that the fans were of different diameters; that would affect it slightly, wouldn't it?

A. It might, slightly, yes.

Q. And that might account for some change?

A. Possibly, yes.

Q. And the fact that the fans run at a little different speeds would affect it somewhat?

A. That might make some difference.

Q. But it is substantially the same?

Mr. Williamson: Now, I object to that as repetition; he has answered that two or three different times.

By Mr. Ely:

Q. Isn't it substantially the same, except for such variations as might be due to a difference in the size, or in speed of rotation of the fan, isn't that true?

546 A. Well, no; I would not say that.

Q. Well, as a matter of fact,—

A. (interrupting) I did not take this data at all; I know nothing about it.

The Court: This data is on what machine?

Mr. Ely: This data is on the machine that you saw over on Thirteenth Street, Your Honor; that is the Snow machine as we exhibited it.

Mr. Williamson: Now, we repeat our objection to these diagrams that Mr. Ely has been putting before this witness, on the ground that that we never made that machine over there; that is the plaintiff's model of the Snow machine; it is not our machine.

The Court: The objection is overruled.

Mr. Williamson: Exception.

Mr. Ely: (interrupting) I want to offer these two colored diagrams in evidence, Your Honor, as the next plaintiff's exhibits, the colored diagram on section line BB, the Rowley test diagram, as the next plaintiff's Exhibit 22.

(Document marked Plaintiff's Exhibit 22 by the reporter.)

Mr. Ely: And the section DD,—

The Court: (interrupting) Are you offering the letters, and are they offering the figures?

Mr. Ely: We are offering the figures, and they are
547 offering the letters.

The Court: And you are offering the figures?

Mr. Ely: Yes, this diagram is Plaintiff's Exhibit 22. And this diagram DD, colored, is Plaintiff's Exhibit 23.

(Document marked Plaintiff's Exhibit 23 by the reporter.)

Mr. Williamson: The exhibits that are offered in evidence are objected to as incompetent and immaterial, especially as to the coloring of them.

The Court: The objection is overruled.

Mr. Williamson: Exception.

The Court: They will be received in evidence.

By Mr. Ey:

Q. Did you know, Professor Rowley, when we took those tests on Monday last, last week Monday, on Thursday, when we were present,—did you know that that Snow machine had a fan blade, which was four inches less in diameter, than the fan blade of the machine at Sleepy Eye?

A. I knew the fan blade there from the drawing, but I did not know that it was exactly four inches less than the one at Sleepy Eye.

Q. You did not know that it was less?

A. I did not take the exact dimensions of the Sleepy Eye, no.

Q. You did not know, then, whether the fans were the same size in the Sleepy Eye machine, as they were up
548 here, or not, did you?

A. Not from measurement, no.

Q. You did not know that? A. No.

Q. Did you know that the fans were run at different speeds here in Minneapolis from what they were at Sleepy Eye?

A. Well, I took that on the test day; I have shown what speed they had.

Q. But you did not know that when you started out, did you?

A. I did not know that there was a slippage in the belt, no; and I did not know definitely what the speed was, until I took it.

Q. You recall that we asked you to ascertain the speed of rotation of the fans, and the size of the fans, before you started your tests, don't you?

A. I don't know that I recall that; I know, at the time we were taking the tests, you said something about the speed; I don't know just when that was.

Q. And you would not let us check up on those things, until after you had made your tests; do you remember that?

A. Well, we were in the midst of those tests then.

Q. Well, but didn't we ask you to measure the speed of the fans before you made your tests, and was not that request denied?

549 A. I am not sure whether it was before the tests were started. I know that you did have a request of some kind, to measure, or to make some tests.

Q. And you went ahead and made those tests without knowing whether the fans were the same size as the fans in Sleepy Eye, or whether their speed and rotation was the same, didn't you?

A. Well, as a matter of fact, I don't think it made any difference as to the principle of the operation at all.

Q. Oh, you don't think it makes any difference as to the air current, or how fast the fan moves?

A. It does not make any difference as to the method or principle of operation of the machine, as to how fast they move.

Q. It does not make any difference at all?

A. (interrupting) Within reasonable limits.

Q. It does not make any difference as to the size of the fan, or its speed, as to how the current behaves, is that right?

A. I don't think I said that.

Q. Well, does it?

A. The size and speed of the fans will make a difference at the different places in there, and the velocity of the current, and the churning, yes.

Q. Yes. And the fact that the fans are unbalanced will make some difference, will it not, that is, one fan may
550 be rotating a good deal faster than another, and that will make a difference, won't it?

A. That is, if you change it,—any alteration that you would make,—and the speed variance will change it, shift it around; it will shift those eddy currents, and various currents at whatever place in the machine, would naturally be shifted.

Q. Then you would expect to find these same conditions in the exact shape in these areas, as to the currents, between the Sleepy Eye machine and the one you saw here in Minneapolis, would you?

A. I would expect in any two machines, if there was any difference in location at all, that there would be some difference in the general current.

Q. But the principle of operation of the Sleepy Eye machine, and the one down here, is just the same, isn't it?

A. The principle of operation is, yes.

Q. Now, in this area where the current is going in toward the fan, in the Snow machine it is going in in the space between the columns of trays, isn't it?

A. Well, it is going in in whatever the movement is; it is between the columns of tiers of trays, and also between the individual trays. In these, there is a space in there, of course.

Q. Of course, the biggest space is between the column of trays, and the big proportion of the air goes between
551 the column of trays, that is right, isn't it?

A. Well, that biggest space, or, as to the biggest proportion, I could not say definitely what the proportion was there, because I never measured them as to proportion.

Q. And it moves,—the air moves in, in horizontal planes in the columns, in the space between the columns of egg trays, doesn't it?

A. Between the tiers of egg trays.

Q. Yes, in the space between the tiers.

A. Not always in horizontal planes; sometimes, downward.

Q. Yes; sometimes, as well as downward, toward the center?

A. It depends entirely upon where you take you section lines through that area, of course.

Q. But, taking this section here, in Plaintiff's Exhibit 23, that is the section on the line DD,—into the area between the lines 6 and 1, the current is in the main moving in a horizontal line, in toward the fan, in the space between the columns of trays, that is correct, is it not?

A. This one here (indicating)?

Q. Yes.

A. There are some "I's" confined to that limit.

Q. And that movement is at right angles to the plane of the fan?

A. In that movement, the "I's" are substantially at right angles to F, and so on.

Q. Well, they are substantially so?

552 A. No, I want to make that clear. While "I" may be the predominant term there, there still may be some up and down movement, of course; that is not a direct "I."

Q. Well, there may be a wall, as we have said, and the wall veers it again toward the center of the fan?

A. Well, it may veer it up and down anywhere in this.

Q. Well, it always veers toward the center of the fan, does it not? A. What is that?

Q. It always veers toward the center of the fan in that area?

A. Well, with that predominance, but it does not always veer; you can find plenty of points where it does not veer toward the center of the fan, that is, where it will veer in some other direction.

By the Court:

Q. Well, you have marked it on these places?

A. I have marked the different places, yes.

The Court: Well, I can look at it and tell.

The Witness: Yes.

By Mr. Ely:

Q. Now, the movement of air is consistent and is just the same at any time that you go into the machine, isn't it?

Mr. Williamson: That is objected to as repetition. That question was put to the witness a half a dozen different times.

553 The Court: Well, the objection is overruled.

Mr. Williamson: Exception.

A. Well, of course, as I stated before, if you change your trays, you might change your direction, and so on, in there.

Q. Outside of that, you do not know of any reason for change?

A. If you keep the machines running just the same, and don't change anything, the trays or anything, then the movement would be substantially the same.

Q. Have you ever seen either a Smith or a Snow incubator in operation?

A. Not with eggs in it.

Q. You have never seen it actually hatch eggs?

A. No.

Q. How many times have you seen a Smith incubator?

A. Well, three, I think,—three or four.

Q. When was that; when was the first time that you ever saw a Smith incubator?

A. Sometime in the forepart of last September.

Q. Did you make a study of the Smith incubator then?

A. I just observed it in a general way; I observed the operation of it, but not studied it.

Q. When did you see it again?

A. The next time I saw it was down here at the Flour Exchange.

554 Q. And that was when we were there the other day?

A. I saw it before that time down there.

Q. How many times have you seen the Snow incubator?

A. Well, I saw the Snow incubator twice at Sleepy Eye, and I saw this one at the Flour Exchange, and I saw your model, plaintiff's exhibit of the Snow machine.

Q. How much time have you spent testing the Snow machine and the Smith machine?

A. Oh, I don't know,—

Mr. Ralph E. Williamson: That is objected to as immaterial, Your Honor.

The Court: The objection is overruled. He may state.

Mr. Williamson: Exception.

A. I could not state the exact time. I studied it; I think I took around four hours, or such a matter, and then, the tests the other day; I don't remember the exact time that I spent on them; those were tests that are introduced here in the record, and that test was the most,—was more completely recorded than any other test.

By Mr. Ely:

Q. Did you ever make any tests of any kind in the region of the trays, in the circulation, except the tests that we saw you make the other day; have you tested the currents of air in the Snow machine, in the trays, throughout the breadth of the trays?

A. Well, if I understand you, you mean the current in between the trays?

555 Q. No, in the region of the trays.

A. Well, I have taken the current between,—I mean, that I have taken smoke tests between different trays, and I have reached back, farther back, where I could spread the trays, and put smoke to the back,—farther to the back wall, near the agitator or the fan.

Q. When did you do that?

A. Well, I did that probably three or four days before I made the tests,—before I made these tests on there. I don't know the exact date now.

Q. After you get back, out of the corridor, in the Snow machine, the movement of the air at any one spot, back in the trays, is constantly in toward the fan, isn't it, in the area where the current moves in?

A. That is, you mean in these areas that we have been talking about here?

Q. Yes.

A. Well, my diagram there recorded what I found in that test.

Q. Well, your diagrams only cover one test in the center line of the trays, at the test in front of the trays; and now, I am asking you what you found from the rear of the front of the trays, back to the fan?

A. That is, you mean back near the fan?

Q. Take the front of the tray, and right at the rear of the front of the tray, and back to the fan, did you make
556 that test through that area?

A. I did not cover all of that area in there, no; I have taken tests in there intermittently, and at various places in there, but I have not made a survey of the rear between the edge of the center line.

Q. So you don't really know what is going on there, do you?

A. Well, I know something about what is going on there, yes, but I did not take the data when we made these particular tests the other day.

Q. In the Snow machine, we have a closed incubator chamber, do we not?

A. Yes, with the exception of these vents.

Q. That is, the Snow incubator has restricted openings for the interchange of air from the inside to the outside, that is right, isn't it? A. Yes, sir.

Q. And, in the Snow machine, we have a plurality of eggs that are stacked in tiers, one above the other, do we not?

A. Yes, sir.

Q. And we also have eggs which are in various stages of incubation, do we not?

A. Yes, sir.

Q. And we have a current of air in that Snow machine, do we not?

A. Yes, we have a current of air through there.

Q. And the temperature within the Snow machine
557 is equalized throughout; that is your understanding, is it not, in the operation of it, that it is equalized throughout? A. Substantially, yes, sir.

Q. And the moisture is conserved, except such as might escape through these small openings, that is correct, isn't it?

A. Yes; it is conserved, but controlled, of course, by humidifiers.

Q. And the air, the movement of the air in the Snow machine is in continuance and repeated cycles or circuits?

A. No, not in repeated circuits, not of any part of the air that goes all over the machine; you would not expect any portion of the air to follow the same circuit; these eddy currents go all over.

Q. Yes. However, the main body,—leaving out of consideration one particle of air, the main body of air moves in constantly repeating cycles or circuits, does it not?

A. I would not say that, no; it mixes all over. Of course, you can find places in there where there are currents in one direction, or you can find areas in there where there is a general movement, but you could not say that it moves constantly in one direction in the machine.

Q. That is, the body of air moves into the fan, and then it moves around, out of the fan; it is discharged, and it comes back in, and it is upset, but confined to a repeating cycle movement of air in the machine?

558 A. Well, the air goes into the fan, there, and it goes out in all directions, at the peripheries of the fan, and from there it goes to the ceiling and the floor, to the end walls, and then between the fans it comes together, of course, to a general mix, and it works its way back into the corridor, where it is agitated; and then it goes through the trays, coming out, and part of it goes around the trays; some of it starts out from the fan toward the corridor, and goes back before it gets out of the corridor; in other words, generally the currents go in various directions, through the trays and about the trays, and about the machine.

Q. Yes, but the air that comes out of the fan, comes back into the fan, and is re-cycled by the fan, is it not?

A. Well, the air, of course,—it comes back,—I mean, as it goes out of the fan,—as the air goes out of the fan, it must ultimately get back to one fan or the other, or one agitator or the other; it has to continually move, to get some place.

Q. And it moves around and around, in repeated cycles, perhaps, from one fan to another, but in repeated circuits, in the machine, does it not?

A. Well, the air does not go in the same repeated circuits, no.

Q. That is, it may go to one side, and then the other, but the general movement of the body of air is in re-
559 peated cycles, over and over again, through that machine, isn't that right?

A. No, I would not say that.

Q. Well, all the air gets into the fan at some time, and is discharged and returned back to the fan, is it not?

A. Yes, ultimately all the air in the place will pass through the different fans,—mix it.

Q. That is, the circuit, or the cycle is repeated over and over again, in the Snow machine?

Mr. Williamson: I object to the question, as sheer repetition; it has been asked and answered a dozen times.

By Mr. Ely:

Q. I say, isn't it repeated over and over again?

A. No.

The Court: The objection is overruled.

Mr. Williamson: Exception.

A. No, there is no cycle in there that is repeated over and over again.

Mr. Ely: I think that is about all, Your Honor.

Mr. Ely: Just one more question.

Q. There are four fans in the Smith machine, are there not?

A. In the Smith?

Q. Yes.

A. Yes, four fans.

Q. And there are four fans in the Snow machine?

A. There are four of these agitators,—if you want to
560 call them fans.

Q. Yes, in the Snow machine?

A. Yes.

Q Now, in the Smith machine, the air does not necessarily go back to the same fan from which it was delivered, necessarily, does it?

A. Not necessarily.

Q. And in the Snow machine the air does not necessarily go back to the same fan?

A. No.

Q. (Continuing): Which delivers it?

A. No.

Q. That is, in the Smith machine, in taking in a body of air, it may leave one fan and go back to another fan, and then to another fan, that is right, isn't it?

A. Well, that is corerct, but it must follow the same cycle in the machine; you have got to get down through the corridor and up to the trays, to get back to your fan.

Q. That is, it may go back on one side or the other?

A. Yes.

Q. And, in the Snow machine, the body of air as it leaves one fan may go back to one side of the machine or the other?

A. It may go any place.

Q. Yes, it may go back to the fan on the opposite side of the machine, or not, that is correct, isn't it?

A. It may go any place.

561 Mr. Ely: That is all.

Redirect Examination.

By Mr. Williamson:

Q. Professor Rowley, when you tested the Snow specimen of the Smith machine last Sunday, without the curtain, was the intake in its usual form, wide open, the air intake?

A. Yes; everything was just as the previous tests were made.

Q. And the outlets were wide open, were they not?

A. Yes, sir.

Q. There are no controllers of any kind for either the air inlets, or the air outlets, in the Smith machine, are there?

A. No.

Q. If you take any one point in the Snow machine, between the trays, for example, is there, or does the air ever pursue a repeated path, or in a constant direction, or does it change?

A. Well, I would have to say this: To answer that question, you take any point between the trays, and you might find a point beyond where it goes,—this air, of course, goes in one direction continuously, or nearly so; you might find other points where it fluctuates back and forth, and vibrates in various directions.

Q. But, generally speaking, it goes in every which direction?

A. Generally speaking, it goes in various directions.

Q. Did you find, in your test, that there was some point at which it would change, and go for a while in one direc-
562 tion, and for a while in another direction?

A. Yes, there were points at which it goes in and out, or up and down; it changes direction in many points during the continuous operation.

Q. Do you consider that these colored sheets that Mr. Ely showed to you, where he had coloring put in, as to his idea of the representation of the movement of the air in the Snow machine, to be correct or fair?

A. Well, I think these sheets were taken at a specific point, and confined to one specific place, where there was more air movement in one direction than the other,—in order to lay a basis for direct air currents; and, of course, you can separate in any agitated space of air, which is agitated by a regularly moving agitator or fan, or anything like that,—you can always find sections in there which you could analyze to show the general motion, or the general movement of the air, and I think that that is what these diagrams have done; having taken specific sections, and tried to emphasize them.

Q. But, with respect to the general circulation of the air in the Snow machine, are these colorings fair or representative?

A. No, not as to the general circulation.

Mr. Williamson: That is all.

Mr. Ely: That is all.

The Court: We will adjourn until two o'clock this afternoon.

(Hearing adjourned until two o'clock this afternoon.)

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563 (Afternoon Session, November 23, 1932, 2 P. M.)

Mr. Williamson: May it please Your Honor, I ask that Professor Frank B. Rowley be recalled to the stand.

Frank B. Rowley, recalled, testified further as follows:

Direct Examination.

By Mr. Williamson:

Q. I have here a patent, Your Honor, which is set up in the answer and in my response to the order to state what I would rely on this patent was included. Until last night I had not had time to read this patent myself. I have so many other things to do in the handling of this case and that is the reason

why this was not considered when Professor Rowley was before on the stand. I ask you to inspect, Professor Rowley, the copy of the Schwartz United States Patent 535,175, of March, 1895, and state to the Court in your own way what the disclosure of that patent is.

Mr. Ely: Oh, I think that is objectionable, Your Honor. That is not redirect examination.

The Court: It is starting into it over. As a rule we don't go over it again in redirect.

Mr. Williamson: I am not going over any patent I asked him about at all because this patent wasn't before him.

The Court: I would have a right to rule it out. I am not going to, but when you put a witness on the stand you should get through with him and if he is recalled it should be
564 only on matters in redirect examination which the cross-examination brought out. Do you intend to pursue this to any extent?

Mr. Williamson: No, sir. This is the only one and it will only take a few minutes.

The Court: All right. I will allow it.

A. To explain briefly the use of the apparatus, which is stated as a method or apparatus of ordering tobacco.

The Court: Is this the same patent we had before?

Mr. Williamson: No, Your Honor.

The Witness: This is another one, Your Honor.

Q. This is another one for conditioning tobacco, but it is much more elaborate as to heating and moistening and so forth.

A. I would refer to Figure 5 on sheet 5 of the drawings. That represents a vertical cross-section of the apparatus as disclosed and shows racks of tobacco on each side of a central corridor through there. The tobacco is hung on these racks and they are rolled in and out into those compartments. These are large sized racks. At the top center of the corridor is a propeller there or fan B.

The Court: Yes, I see it.

A. Which in this case rotates, drawing the air upward, and from there it splits and goes to the right and left as far as this cut is concerned and over to the sides where it

passes downward and it may pass clear down to the
565 floor—clear down to the lower part where it comes in contact with some water pans, C, on either side.

The Court: Yes.

A. And then it passes—that part of it will pass under the partitions on the outside or division walls which are shown up under the tobacco racks where it comes up through the tobacco. Now, some of that may go up at different places and comes out into the central corridor at different places up through those openings as shown by the arrows. The openings are in the partitions A-9 and A-10. Now, it comes up through here, some of it out there and some there, it goes all around into the circulation again. The pipes, C-2, which are shown in the lower right and lower left hand corner are heating pipes in the water pan and above those water pans are two special devices shown as C-3 for spraying water into that downward current of air as it passes down the outside corridors. It is—there are other modifications of it, of the device which—one of them is shown in Figure 3, the corresponding section in which the circulation is substantially the same, but the air is carried there by pipes or conduits which are shown as B-4 and B-5 at the sides of the tobacco trays instead of coming down that open corridor and that air also passes down and across or passes over, then it passes through those tobacco racks which may be—and it may cross over or go up through there and in the central corridor. It
passes—there is also a humidity of water pan with
566 heating pipes C-2. Another modification of the same device is shown in Figure 1 of sheet 1. Now in that case this particular drawing, there is only one rack of tobacco shown on the right and then—there is a rack of tobacco on the right, and then—there is a partition shown in A-2, in section, which divides the rack from the left hand side of the apparatus here. The propeller is shown at B at the top. In this case it is in a horizontal, that is the shaft of it is in a horizontal position so that it draws the air through into the chamber at the left where it forces it down over some coils C, marked C prime. Those are cooling coils for the purpose of regulating the humidity in the air; if it is too much, for the purpose of condensing it out; and down below those coils are the humidity pans or heating coils shown at C-2, the bottom here, and the circulation of air comes down through underneath that partition A-2, as shown here, and up through the tobacco. Or in other words it makes a cycle down on the left and up on the right. Now if I may read just for a mo-

ment from the description. I would like to quote from line—the purpose of it, from line 19, page 1, of the specifications, starting after the comma: "To provide an efficient method of ordering tobacco by circulation and recirculation, which consists in presenting air of one temperature to water of a different temperature in a chamber to cause the latter to be combined so as to produce a humid atmosphere which is forced into the presence of the tobacco absorbing the humidity of the air and again conveying the same into
567 the presence of water to revivify the same and presenting to the tobacco to effect the complete ordering thereof, and, third, to provide suitable apparatus for the conduct of the method of ordering tobacco of my invention.

"My invention stated in general terms comprises a method of ordering tobacco by circulation and recirculation which consists in presenting air of one temperature in the path of water of a different temperature to produce a humid atmosphere and presenting to suspended tobacco in such manner as to cause an absorption of the humidity of the air thereby and conveying the air deprived of its humidity to water to supply the same with humidity and presenting again to the tobacco to effect complete or thorough ordering of the same."

Now, if I may just skip to page 2, line 39, "In the operation of the apparatus of Figs. 1 and 2, the air is forced by means of the propeller or agitating device B," (that refers to this fan device up here. They call it a propeller or an agitating device), "into the chamber a, and the temperature of the water in the chamber a, being raised by means of the steam coil c^2, so as to cause the air therein freed from the agitating influence of said device D, and in a more or less calm state."

I won't quote any further than that, I guess, but that continues describing the apparatus, and then if I might turn to page 3, I might read line 43, beginning at claim 1.

"The method of ordering tobacco, which consists in continuously presenting air of one temperature in a chamber to water of another temperature to produce a humid
568 atmosphere conveying the same into the presence of tobacco to effect dampening thereof, and causing successively the air deprived of its humidity to be revivified and again presented to the tobacco to effect ordering thereof, substantially as described."

I will read just one more claim, claim 7, page 3.

"An apparatus for ordering tobacco, comprising a housing provided with two communicating chambers, a blowing or forcing device for circulating and recirculating air, a water tank or trough provided with a heating device, and means for supporting tobacco in said housing, substantially as and for the purposes described."

Mr. Williamson: The patent identified by the witness, to-wit, the Schwartz patent, 535,175 of March 5, 1895, is offered in evidence on behalf of the defendant to be marked Defendant's Exhibit T, and a request is made that it be bound in with the other patents of the portfolio.

The Court: Received.

(Defendant's Exhibit T marked for identification by the reporter.)

Mr. Williamson: This Schwartz was not a reference on the file wrapper record of the Smith patent in suit but it was introduced in evidence in some of the other suits and referred to in some of the other decisions and particularly emphasized in the decision of Judge Hickenlooper in the Petersime case.

(Witness excused.)

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569 Mr. Williamson: In the early stages of taking of testimony I referred, Your Honor, to transcript of record in what we call the Boling case, which had in it a drawing, headed "Incubator of E. H. Snow, Sleepy Eye." I stated I would procure a photostat of that drawing, and have done so and I now offer it in evidence—or did I offer it then?

The Court: We can have it marked in lieu of the other.

Mr. Williamson: Yes.

The Court: You better have it marked.

Mr. Williamson: I don't know whether I offered it or not.

Mr. Ralph Williamson: No, it wasn't.

Mr. Williamson: Defendant's Exhibit U, and with the words "Drawing entitled Incubator of E. H. Snow, Sleepy Eye, Minnesota", taken from the transcript of record in the Boling case. I think it was the Buckeye Incubator Company and Samuel B. Smith versus Bert S. Boling. That was just, Your Honor, to see that you understood what was in issue in one of the other cases.

The Court: Received.

(Defendant's Exhibit U marked for identification by the reporter.)

Mr. Williamson: One of the cases under this Smith patent which reached the Circuit Court of Appeals of the Sixth Circuit is what we have been designating as the Petersime case, and I have here a copy of the United States
570 Patent 1562787 of November 24, 1925, granted to Harry M. Petersime, and which I understand discloses the structure which was employed by the defendant in that case according to the description thereof which appears in the decision of the trial court in that case, Judge Hickenlooper, and I offer that in evidence to be marked Defendant's Exhibit V, and with the words Petersime Patent, 1562787, November 24, 1925. That is simply to help you to better understand that case.

The Court: Received.

(Defendant's Exhibit V marked for identification by the reporter.)

Mr. Williamson: Defendant rests.

(Recess.)

Mr. Williamson: May I have just a second before you go on. I have nothing available now, Your Honor, to show the defendant's structure in the Blom case, but I have written to defendant's counsel in that case for transcript of the record of appeal, and when it comes I ask permission to show it to you or leave it with you.

Mr. Ely: I object to that, Your Honor. I think everything should be here.

The Court: Well, we will have to have the case completed, that is as far as the trial is concerned, now.

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571 Plaintiff's Rebuttal Case.

LENA LAUX's Testimony.

Lena Laux, a witness called on behalf of the plaintiff in rebuttal, testified, under direct examination, on pages 617 to 628, and under cross-examination on pages 629 to 643 of the typewritten trial record, which is here reproduced in full.

572 Lena Laux, sworn on behalf of the Plaintiff in rebuttal, testified as follows:

Direct Examination.

By Mr. Ely:

Q. Please give your name and residence.

A. Lena Laux, Mankato, Minnesota.

Q. You will have to speak up a little bit. Speak up a little louder. A. Lena Laux, Mankato, Minnesota.

Q. You are of legal age? A. Yes.

Q. What is your occupation now?

A. I am not doing anything now.

The Court: What did she say?

Mr. Ely: She is not doing anything now. Will you speak up a little louder.

Q. Did you ever work for Mr. E. H. Snow, the defendant in this case? A. Yes, I did.

Q. During what period?

A. From March, 1925, to the end of January, 1930,—no, the end of the year, 1930.

Mr. Williamson: I can't hear a word she says, Your Honor.

The Court: Well, repeat it. I can't give her a louder voice than she has.

573 (Question and answer read by the reporter.)

Q. What were your duties while you were working for Mr. Snow?

A. I did the bookkeeping and wrote out the egg checks, and waited on customers.

Mr. Williamson: There it is again, Your Honor. I can't hear a word she says.

The Court: Have your son repeat it to you. I can't give her a bigger voice than she has got. She said she was doing bookkeeping for him during that time.

Q. Go right ahead, and say what your duties were.

The Court: Please speak as loud as you can. He can't hear.

A. I did the bookkeeping and wrote out the egg checks and took care of the correspondence.

Mr. Ralph Williamson: Wrote out the egg checks and took care of the correspondence.

Mr. Williamson: I want the witness to talk louder.

The Court: Well, I don't know how to make her talk any louder.

Mr. Ralph Williamson: If I repeat it after—

Mr. Williamson: No, no, if anybody repeats it let the reporter repeat it.

Q. During how much of the year did you work for Mr. Snow of each year?

A. Well, I worked—I usually was laid off three
574 months of the year during the summer, but the last year I worked all year.

Q. Was there anyone else in the office besides yourself, any other employees in the office besides yourself?

A. No, there wasn't.

Q. Did you get around Mr. Snow's plant in the course of your duties? A. Yes, I did.

Q. Did you get downstairs in the cellar?

A. Yes, I did.

Q. In the period from 1925 to 1929, how many incubators did Mr. Snow operate?

Mr. Williamson: The question is objected to as incompetent. It has not been shown that this witness knows anything about his incubating business or had any opportunity to see anything about his business.

The Court: Overruled.

Mr. Williamson: Exception.

Q. Now will you state during the period from 1925 to 1929, how many incubators did Mr. Snow operate at Sleepy Eye?

A. Well, there was five and I think there were six. I am not sure about the sixth one. Three of—well, when I came there there was two of Smith's on the first floor and three of his home-made ones in the basement. I am not sure about the third one, but I do know there were two there.

Q. And during this period do you know whether he
575 operated all of these incubators in the hatching of chicks? A. Yes, he did.

Q. Did you ever get into any of those machines that were in the cellar? A. Yes, I did.

Mr. Williamson: Objected to as incompetent and immaterial. It has not been shown that this woman is qualified to understand an incubating machine.

The Court: He hasn't asked her anything about that. He has asked her if she got into one of those machines.

Mr. Williamson: Yes, all right.

Q. Did you ever get into the Smith's that were on the first floor?

Mr. Williamson: Question objected to for the same reason.

A. Yes, I did.

The Court: Overruled.

Mr. Williamson: Exception.

Q. In general how did the appearance of the incubators that were in the cellar compare with the Smith's that were on the first floor?

Mr. Williamson: Objected to as absolutely incompetent. It does not appear that this woman knows what a Smith machine is, nor what a Snow incubator is.

The Court: Of course that may be true, but she can give the general appearance of it.

576 Mr. Ely: Didn't you answer my question?

The Court: Answer it over. I didn't hear it.

Q. Didn't you answer that last question before Mr. Williamson interrupted?

A. I think I did, whether I had been in the machines?

Q. Yes.

A. Yes.

Q. And how did those machines that were down in the cellar compare with the machines that were upon the first floor?

Mr. Williamson: Question objected to as not only incompetent, but immaterial.

The Court: Overruled.

Mr. Ely: She has answered the question twice.

The Court: Repeat the answer now.

A. They looked just the same as the Smith machines.

Q. When you went in the machines did you feel a draft of air in the machines which were in the basement?

Mr. Williamson: Now, she didn't say she went into the machine.

The Court: Yes, she did.

Mr. Williamson: Oh, did she? Well, I will take it back then.

Q. Did you feel a draft of air?
A. Yes, I did.
Q. Were there fans in those machines that were down in the basement?

577 Mr. Williamson: Objected to as leading, grossly leading.

A. Yes.

The Court: Overruled.

Mr. Williamson: Exception.

Q. Do you know how the fans were located?
A. Overhead.
Q. Were there egg trays in those machines which were down in the basement? A. Yes.
Q. How were they located and arranged compared with the location and arrangement of the trays in the Smith machine?
A. Well, they hung on chains—

Mr. Williamson: Same objection, Your Honor. This woman hasn't stated that she knew the difference between the Smith machines and the other machines.

The Court: She may answer that question. Anybody could answer that question looking at that machine. Overruled.

Mr. Williamson: Exception.

Q. Do you know whether there were any hatching trays in those incubators downstairs?
A. Yes, there were.
Q. Where were they located?
A. In the machines hanging slant on chains.
Q. How about the nursery trays?
A. They were at the bottom.
578 Q. And in that respect they were like the Smith?
A. Yes, they were.
Q. What about the outside appearance of these three machines that were in this cellar?
A. One was grey.
Q. One was grey. What about the others?
A. They were a dark shade.

Mr. Williamson: I can't hear a word she says, Your Honor.

Mr. Ralph Williamson: They were a dark shade.

Q. Did Mr. Snow carry on commercial hatching in those machines?

Mr. Williamson: Objected to as incompetent.

A. Yes, he did.

The Court: Overruled. I think anybody, any person whether an expert or not, could tell whether or not he did that if they were aware of the fact.

Mr. Williamson: She don't know what commercial business is.

Q. Do you know the extent to which these machines that were in the cellar were operated?

Mr. Williamson: The same objection.

The Court: Overruled.

Mr. Williamson: Exception.

Q. I will put it this way: Were they operated experimentally?

A. No, they were operated to hatch chicks and sell
579 them, ship them out for orders.

Q. During what years?

A. During all the years that I was there.

Q. Were these machines ever torn down while you were there? A. No, they were not.

Q. How were the eggs and chicks handled back and forth between the machines that were down in the cellar and the office?

A. Well, the eggs were taken down cellar and trayed up down there and pushed into the machines and when the chicks hatched they were carried up by the men.

Q. How many approximately; were there one or two boxes of chicks that were brought up from the cellar or were there a number of boxes of chicks brought up during the time you were there?

A. There were hundreds of boxes.

Q. And that applies during the years you were there?

A. Yes.

Q. Did you have what was known as a setting book?

A. Yes, we did.

Q. What did you keep track of in that setting book?

Mr. Williamson: She said—she didn't say she kept it.

A. The number of trays that were set in each machine.

Q. Did you keep track in that book of the number of eggs that were set in those machines that were down in the cellar? A. Yes.

580 Q. Who kept that book?

A. Why, it was left on the desk. I had to use it every day to fill orders.

Q. Can you hear what she said?

The Court: She said the book was kept on the desk and what else did she say?

The Witness: I had to fill orders with it. I had to look at it every time I filled orders.

Mr. Williamson: I can't hear.

The Court: She said she had to fill orders with it; she would look in that book and fill orders from that book.

Q. Were the several machines Snow had at his plant numbered? A. Yes, they were.

Q. And how did you keep track of the setting of eggs in the particular machines?

A. Every machine had a number.

Q. And when you made a record of the setting of eggs did you make a record in your book of the machine that they were set in? A. Yes, I did.

Mr. Ralph Williamson: Object to this. The witness has not testified she made the records of the setting of the eggs in that book.

The Court: Well—

Mr. Ely: I thought she did.

Q. Did you or did you not keep that record in the
581 setting books?

Mr. Williamson: Why didn't you say incompetent there?

Q. Were there any precautions taken in the plant to conceal the operations which were going on in the cellar? If so, state what they were.

Mr. Williamson: The question is objected to as immaterial.

A. Yes, they were.

The Court: Overruled.

Mr. Williamson: Exception.

The Court: Go ahead.

A. The door was kept partly covered with a sweater so the door knob wouldn't show and it was understood that the help shouldn't let anyone know that there was any machines down there.

(Answer read by the reporter.)

Mr. Williamson: The first words there of her answer was "none." Did you get that?

The Court: I don't think so.

Mr. Williamson: That is the way I understood it.

Q. What about bringing chicks up from the cellar? Was there any instructions or any custom with regard to bringing chicks up from the cellar?

A. It was understood the help shouldn't bring up chicks when there were customers in the store.

582 Q. Do you know or have you any idea of the approximate number of chicks that were sold that had been hatched in those machines that were down in the cellar?

A. There were thousands of them every year. I don't know just how many.

Mr. Williamson: Now, she said she didn't know how many. Have you got that down?

The Reporter: Yes, sir.

Q. Well, I didn't expect you to know the exact number.

Mr. Williamson: No.

Q. Now in order better to locate those three home made machines, in what part of the cellar were they located?

A. Well, they were in the old basement as you go down the stairway on the left hand side.

Mr. Williamson: All I could hear was—

Mr. Ralph Williamson: I will give it to you. They were in the old basement as you go down the stairway on the left hand side. Is that correct?

The Witness: Yes.

Q. Where was this door you speak about that was covered with a sweater?

A. It was upstairs.

Q. Do you know when Mr. Snow built the machine in which the fans were on the side walls?

A. In the year of 1929.

Q. And do you know what was done with the Smith
583 machines that were upstairs after these machines were built which had the fans in the side walls?

Mr. Williamson: The question is objected to as immaterial. I don't think the witness said there were any upstairs.

A. The two on the first floor?

The Court: Overruled.

Q. Yes.

A. They were torn down and moved to some other place. I think it was Montevideo.

Mr. Williamson: I can't hear a word she said.

The Court: She said they were torn down and moved to Montevideo.

Mr. Williamson: Thank you.

Q. And after those Smith machines were moved out, what machines did he use during the next hatching season?

A. He used those that he made last.

Q. How many of those machines did he use?

A. Three of them.

Q. Did he or did he not use the three machines that were in the other part of the cellar?

A. Yes, he always used them also.

Q. What part of 1929 did Mr. Snow build these machines that had the fans in the side walls?

A. He started in the fall.

Mr. Ely: That is all.

584 The Court: You may cross-examine.

Cross-Examination.

By Mr. Williamson:

Q. Now, if I understood your testimony correctly, you said you worked for Mr. Snow from 1925 to 1929, did you not? A. 1930.

Q. How long did you work there in 1925?

A. From March until, I think, about the first of July.

Q. About the first of July? A. Yes.

Q. How long did you work there during 1926?

A. I think I started in the fall of the year. I don't remember. It was November or sometime along in there.

Q. November? A. I think so.

Q. November the only month you worked there?

A. Well, during all of the hatching season until the next July.

Q. During the hatching season from July to November?

A. From November to July.

Q. From November to July? A. Yes.

Q. What is the year? A. 1926.

Q. 1926. How long did you work there in 1927?

A Well, we usually started about the same time every year.

585 Q. Same time of the year?

A. About the same time, yes.

Q. Every year? A. Yes.

Q. Well, when did you start then?

A. About—well, I don't know the exact dates, but I think it was October or November.

Q. Have you got any record with you by which you can fix the date? A. No, I haven't.

Q. Any books or anything of that kind?

A. No, I haven't.

Q. Any record of any sort? A. No, I haven't.

Q. You are just depending on memory, are you not? You are depending solely on memory, are you not, for dates or time? You have no record by which to fix those dates here with you, have you?

The Court: Have no books or anything of that kind?

The Witness: No, I have no books. No, I know that.

Q. How long was it in the year—

The Court: The last time she said she was there from November 1925 to July in 1926, didn't you?

The Witness: 1925, I started in March.

The Court: And worked until what time?

The Witness: Until about July.

586 The Court: Then when did you start to work for him next?

The Witness: I don't know. I think it was in the fall of the year.

Mr. Ely: I can't hear what you say.

The Witness: November, I think.

The Court: November of 1925?

The Witness: No, 1926.

The Court: How long did you work then?

The Witness: Until the end of the hatching season.

The Court: When was that?

The Witness: Until about the first part of July.

The Court: You worked then from November, 1926, to July, 1927?

The Witness: Yes.

The Court: Now go on.

Q. How long did you work there in 1928?
A. About the same time.
Q. About the same period? A. Yes.
Q. Did you work there in 1929? A. Yes.
Q. How long did you work there?
A. About the same time during the hatching season.
Q. During the hatching season?
587 A. Yes.

The Court: That commences every year in November or December?

The Witness: We got out the advertising and started about that time.

Q. There was no hatching done in the month of November and December, was there? A. No.
Q. Your employment wasn't on the hatching then during those periods of time?
A. No, we got out advertising.
Q. What advertising?
A. Well, whatever there was to do.
Q. Did you have anything to do with the advertising?
A. Yes, I did.
Q. And as a matter of fact didn't you get the advertising all mixed up? A. No, I didn't.
Q. Weren't you discharged on account of your mixing up of the advertising for that concern?
A. No, I wasn't.
Q. What is that? A. No, I wasn't.

Q. You were discharged, weren't you? You were fired, weren't you? A. No, I was not.

588 Q. What is that? A. No.

Q. How is it you aren't there yet then?

A. Well, Mr. Snow wanted to put in some of his relatives.

Q. In other words, he fired you. He stopped you from working there, didn't he?

A. No, he didn't.

Q. He didn't continue to employ you, did he? You were discharged, were you not? Answer that question, please.

The Court: Don't be scared about it. Just answer it.

The Witness: Well, I wouldn't put it that way, no.

Q. Well, weren't you put out?

A. Well, yes.

Q. And why were you put out?

A. I don't know.

Q. Wasn't it because you got the advertising all mixed up? A. No, it wasn't.

Q. What reason do you think you were put out for?

A. I don't know. We had no trouble of any kind.

Q. You say that you kept the records of the number of chicks that were hatched while you were there?

A. I didn't say that.

Q. You didn't say that? A. No.

Q. Who did keep the records?

589 A. Nobody did.

Q. Nobody kept a record of the number of chicks that were hatched, do you mean to say that?

A. Well, I got—I booked the orders.

Q. That wasn't my question. Was any record kept of the number of chickens that were hatched while you were there and throughout the whole period that you were there?

A. Not exactly, no.

Q. And was there any record kept of the number of chicks that were sold?

A. Well, we had the orders to go by and that was—

Q. Was any record kept and, if so, did you keep the record?

A. Well, I did the book work, and got out the orders, yes.

Q. But the question was whether you kept any record of the sales of chicks? Did you, yourself?

A. Well, I had the books where the orders were—the chicks were shipped and I would know in that way.

Q. That is the only way and that is the only record you had anything to do with, was it?

A. Well, that is all we had.
Q. You say you kept that? A. Why yes.
Q. Wasn't Mrs. Snow employed there at the same time?
A. She helped, yes, but—
Q. Wasn't she in charge?
A. She wasn't there a good deal of the time.
590 Q. When she was there it was part of her business to keep the records of those chicks? A. She helped.
Q. Was she in charge of it? A. No.
Q. Were you over her?
A. I wouldn't say I was over her, but I did most of it.
Q. Did you give orders to her?
A. I wouldn't say I did, no.
Q. She did that, didn't she?
A. She wasn't there most of the time.
Q. What do you mean she wasn't there most of the time?
A. She was gone so much of the time.
Q. You say you kept the records of the orders, didn't you, on sales? Which was it? Did you say the record of the orders or the sales? Which was it that you kept?
A. Well, our orders were in the book and I kept the books.
Q. The orders were where? A. In the books.
Q. And is that what you kept? But you didn't keep any record of the sales, did you?
A. Just what sales do you mean?
Q. I mean sales of the chicks.
A. Why, that is the record, isn't it?
Q. The order is the only record you got. How many chicks were hatched there during the first year of your employment?
591 A. I don't know. We didn't figure that up.
Q. How many were hatched the second year?
A. We didn't figure it up.
Q. How many the third? A. We didn't—
Q. How many the fourth?
A. I say we didn't keep that record.
Q. How many? At least you don't know, do you?
A. Well, I didn't figure it up.
Q. You don't know then, do you, from memory?
A. Well, I have an idea.

Mr. Ely: State it.

Q. You have no definite idea as to the exact number, have you? A. They must have—
Q. Do you have an idea how many then? What is your idea? A. Why millions of them.

Q. In what length of time? You mean through the whole period? A. No, every season.

Q. Millions in every year? A. Yes.

Q. By actual count? A. (No answer.)

Q. Millions every year. From whom did you take your orders while you were employed there?

A. Mr. Snow.

592 Q. Mrs. Snow? A. Mr. Snow.

Q. Didn't you take orders from Mrs. Snow also?

A. Sometimes.

Q. And was Mr. Snow there most of the time that you were there?

A. Why, he was gone a good deal while I was there.

Q. He was there looking after his business nearly all of the time, wasn't he?

A. Why he used to drive to the other plants nearly every day.

Q. Yes, back and forth.

A. Yes.

Q. And he was looking after it all of the time, wasn't he?

A. (No answer.)

Q. Were there any other girls employed there at the same time you were? A. Yes.

Q. Name all that you can think of.

A. Viola Ebelseizer.

Q. Any others? A. Miss Cotton.

Q. Any others? A. Tillie Marquadt.

Q. Any others? Is that all?

A. No, that isn't all. There is more than that.

593 Q. That is all you can think of, is it?

A. Well, I can think of more if you give me time. And the Haskin girls, two of the Haskin girls. And then during the advertising time there were more than that, but they were only there for a short time.

Q. What other girls were there the first year you were there? A. Viola Ebelseizer and Miss Cotton.

Q. What girls were there the second year you were there?

A. Viola Ebelseizer and Tillie Marquadt.

Q. What girls were there the next year you were there? That would be the fourth year.

A. Viola Ebelseizer. Oh, I don't just remember that other one that worked a few days. I don't remember the other one. I just—

Q. What girls were there the last year, the fifth year you were there? A. Viola Ebelseizer was there.

Q. Who? A. Viola Ebelseizer.

Q. Is that all?

A. Well, we would have different ones in—
Q. Well, is that all that you remember?
A. Just now. There were more.
Q. Name them, if you know.
A. I mean just during the advertising season.
Q. Well, what is her name?
594 A. Well, the two Haskin girls and Mrs. Johnson helped and Mrs. Dolmeier.
Q. What year were those three people there that you have last named? A. 1930.
Q. 1930? A. 1930.
Q. That is the only year they were there, isn't it?
A. Yes, some of them.
Q. Now did some of these other girls have anything to do with the advertising? A. Yes.
Q. Was it under your control? Did you have charge of those girls that had something to do with the advertising?
A. Well, I don't say that I had charge of them, no. Why?
Q. Did they help you? A. Yes.
Q. Isn't it a fact that you had those girls and you yourself mixed up the advertising so badly that Mr. Snow had to discharge you? A. No, that isn't so.
Q. Didn't you mix up the advertising? A. I did not.
Q. Didn't you purposely mix up the advertising?
A. No, I did not.
Q. Didn't those girls do it at your orders?
595 A. No, I did not.
Q. How old are you? What is your age?

Mr. Ely: I beg your pardon—

Mr. Williamson: I think that I ought to know the age of this woman so as to know whether she is capable of understanding anything about these machines.

Mr. Ely: You are of legal age?

The Court: I don't know as I should require her to state her age. The Court can observe her age.

Mr. Williamson: What is that, Your Honor?

The Court: I say the Court can observe about her age.

Mr. Williamson: All right.

Q. Did you ever have any course in mechanical training relating to machinery?

Mr. Ely: I object to that.

Mr. Williamson: I think that I have got a right to find out.

The Court: I haven't supposed that she has, but she may answer.

Q. What was your answer? You never had any course in instruction in relation to how machinery was made and so forth, did you? A. Why no.

Q. That is what I thought. You never helped to construct machines, did you, of any kind?

596 Mr. Ely: Oh, I object to that—

Mr. Williamson: I think I have got a right to—

The Court: I will take it for granted that she is not a mechanic, and never knew how to make one of these machines and never made one. I didn't admit her testimony on the ground she was an expert. As far as I admitted it I thought anybody who had common sense could say so.

Q. You spoke in some of your testimony of a Smith machine as having been used there by Mr. Snow, and then you said there were some other machines used there by Mr. Snow, did you not? A. Yes.

Q. Do you know the difference between the Smith machine and the Snow machine that you saw there?

A. Well, I mean those old machines that he made.

Q. I mean the structure and the operation of them. You don't know that, do you?

A. Well, they looked just like the Smith machines.

Q. You couldn't describe it, could you? You couldn't tell the way in which those different machines operated, could you? A. Why—

Q. You don't pretend to be able to describe how those machines operated, do you?

A. What way do you mean?

Q. And the differences between them.

A. What way do you mean?

Q. I mean the way the machines operate when in use.

597 A. By fans.

Q. By what? A. By what or how?

Q. I asked you whether you can give a general description of them. You are not a mechanic, are you?

A. No.

Q. And you can't describe those machines, can you? Answer the question.

A. In what way should I describe them?

Q. I am asking you whether you can describe them. I am not telling you how to describe them. Can you describe them?

A. Why, yes, I can describe them.

Q. Describe them then in your own way and state the differences between them.

The Court: If you want to, go ahead and describe, for instance the Snow machine.

Mr. Williamson: Beg pardon?

The Court: Tell her to describe one kind at a time.

Mr. Williamson: Well, I don't think she knows the difference between the kinds.

The Court: Well, describe the Smith machine.

Mr. Williamson: I have asked her if she knows the difference between the kinds and she said she didn't.

The Court: All right.

Q. Now, go ahead and describe anyone that you know there that was used there while you were employed there.

598 A. Well, the trays are put in and they are slant; they hang on chains and they are run with a fan. Well, that is all there is, isn't it?

Mr. Williamson: Did you get that down? She says that is all there is, isn't it? That is all.

Redirect Examination.

By Mr. Ely:

Q. Did Mr. Snow give you a recommendation after you left him? A. Yes, he did.

(Witness excused.)

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599 CLARENCE J. HOLMES' Testimony.

Clarence J. Holmes, a witness called on behalf of the plaintiff in rebuttal, testified, to the following effect:

Under Direct Examination.

He stated that he lives at Jasper, Minnesota, and that his present occupation is the "selling of poultry remedies and culling chickens". Says he lived at Sleepy Eye, Minnesota, from January 1927, until 1929, and while there worked in an oil station some, and in Harold Davis' hatchery for "a few years".

Says that Snow was running a hatchery in Sleepy Eye during that period and he once went into his hatchery to see how

he was setting his eggs, and saw the machines which he had. Says it was in the middle of the day, sometime in May 1927. Says Snow had two Smith machines on the first floor. Says that he went into the cellar on this trip and saw there two machines, which in size were practically the same as the machines upstairs. Says the two differed a little in their outward appearance, as one had a metal construction covering the outside. Says they were practically of the same size.

Being asked whether he "saw into either one of these machines", he says that he did on one only. Says there was a man opened the doors and carried eggs into the machines while he was there, and says he saw this man turn on the lights right over the door, and he saw trays hanging on the chains with eggs in them, and he also saw fans located overhead. Says this occurred in the basement "under the old building". "The new building was not there at the time I was there".

600 Says the machine of which he saw the inside was running as he could see the fans rotating and feel the heat. Being asked whether the other machine was running or not, his answer was "I could hear the fans from the outside". Said he did not see any curtains in that machine. Says the egg trays were hanging on chains, some of them being slanted and the others straight. Says the door of the incubator was located "on the east side facing New Ulm". Says he saw the man walk into the machine. Says Snow was not there at the time he was there.

Says there was a sack or blanket of some kind over the doorway to the cellar stairs. "It hung right over the door as you went downstairs".

Under Cross-Examination.

The testimony given under cross-examination, consisted of a single question and answer, reading as follows:—

"By Mr. Williamson:
Q. How long were you there at that time?
A. In the hatchery I presume about ten minutes."

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601 MALCOLM G. REYNOLDS' Testimony.

Malcolm G. Reynolds, called as a witness on behalf of the plaintiff in rebuttal, having been first duly sworn, testified to the following effect, to-wit:—

Under Direct Examination.

States that he lives at Worthington, Minnesota, and that his occupation is an automobile mechanic.

Says that he worked for Mr. Snow, as he recollects it, in the latter part of June, 1930, until September of the same year, selling remedies and checking over flocks of chickens.

Being asked whether he ever went through the Snow hatchery at Sleepy Eye, he answered "Yes, sir". Said he saw it first in the middle or fore part of May, 1913. He says that this was before he began to work for Mr. Snow. Did not yet know Snow.

Being asked what his object was in going into the hatchery, he answered,

"Merely to go in and see the hatchery and look around, that is all".

Says he went down into the cellar. Being asked whether there were any incubators there in the cellar, he answered "Yes," and that according to his recollection "there was six of them". States that three of these were in the new part of the basement and three in the old part of the basement. Says the old part of the basement was on the left side as a person went downstairs.

Being asked whether he could state the construction of those machines which were on the right, he answered,

"They were ventilated from a fan circulating type driven from the motor on the side—wheel driven."

602 Says the fans were on the inside—on the side walls on the inside.

Then, having been asked to "go over to the left hand side of the cellar", the witness answered that he went through a door below the stairway to the left and saw those machines. Being asked if he knew how those were constructed, he answered:

"The machines from the outside, I think looked very much alike."

Says he saw the inside of one of the machines, and being asked to describe the inside of that machine, he answered,

"The machine I saw on the inside was ventilated from overhead draft and ventilating system from fans driven by the motor overhead."

Says there were eggs in the trays and the trays on each side of a corridor hung by chains. Says the fans were located directly overhead. Being asked whether there were any curtains on the sides of the corridor of these machines, he answered, at the time he was there, there was one curtain on one side, and that there were three fans running.

Being asked by the Court to state whether the machines had any names on them, the witness answered:—

"There was no names on them that I saw."

Being asked to state the external appearance of these machines, he answered:

"One of them was a little different color on the outside structure—it was like a metal cover, and one of them was wood—I believe. I believe it was wood."

Says that the color of the other one was grey.

There was no cross-examination.

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603 HAROLD E. DAVIS' Testimony.

Harold E. Davis, a witness called on behalf of the plaintiff in rebuttal, having been first duly sworn, testified to the following effect.

Under Direct Examination.

States that he lives at Sleepy Eye, Minn., and has lived in Sleepy Eye and vicinity all his life. Had been on a farm until 1924, when he moved into Sleepy Eye. Says he has known Mr. Snow as long as Snow has been in Sleepy Eye.

Being asked what Snow was doing prior to 1924, Davis answered that when he first knew Snow he was employed as a tinner in a hardware store. Says Snow hatched about 1200 eggs for him in 1924, which eggs Davis got from his flock of chickens, and took the eggs to Snow's hatchery to get the chickens hatched. Said Snow had an incubator and Davis got into it when he was there to check up on his hatching. Says the outside of the machine was covered with galvanized metal. Says he was inside of that incubator "a number of times through the season", and knows the construction of that incubator. Being asked to describe it, the witness answered

"You enter a door in the middle of one side, which at that time faced south, and you walk down the corridor and the fans are overhead—the circulating fans overhead, and trays

on either side hang from chains with curtains in front of the trays."

Then being asked by the Court "About how large was the incubator on the outside approximately", the witness answered

"Well in actual feet, I couldn't say exactly."

604 Then being asked if he could make any comparison, the witness answered

"I know the size of the Smith and I know the size of that were the same." * * * * * * They were practically the same."

States that he had operated incubators commercially and is familiar with the construction of the Smith incubator.

Being asked to state how this incubator, seen by him in Snow's plant in 1924, compared with the Smith, the witness answered

"The hatching was the same; that is mechanically it is the same."

Says the eggs were set in individual trays with about 132 eggs and they were hanging on chains on each side of the corridor and below the turning trays were hatching trays. Says Snow set the eggs periodically so that they would not all hatch at once.

Being asked where Snow commenced setting the eggs, the witness answered

"I think they started at the top. Of course sometimes they were set at odd times as the eggs came in."

Says he again saw that machine after the hatching season of 1924 was over. Assisted Snow to turn the machine around. Being then asked whether Snow made any statement to him about that incubator, the witness answered "Yes". Then, being asked what did he say, the witness answered

"Well I was curious to see how the castings and the material for the incubator were and the castings is what I had in mind mostly, and, of course, he did not say how he got them, but he said he would get by with it".

The next question was "What did he say" and the witness answered. "He said to the effect that he was getting by with it".

605 Then, being asked to give Snow's words, or the approximate words used by Snow, the witness answered "I couldn't repeat the words".

The witness was then asked to give the substance of what Snow said, and the witness answered as follows:—

"To the effect he had found a way he could get his material without too much information and he could get by with it."

Then Davis testified that the Mr. Holmes, who had just previously testified, worked for Davis in 1927, 1928 and 1929, and that he heard his testimony given.

States that he recalls the visit of Mr. Holmes to the Snow hatchery, and being asked to state what he remembered about it, Davis answered as follows:—

"Holmes and I—he was working for me and we were becoming worried about being overstocked with chicks, so he decided he was going to see whether Mr. Snow was setting as strong or not—the idea was that if he was setting the eggs heavy, we would not set eggs."

Then Davis said that he was operating a hatchery at that time.

Under Cross-Examination.

Says that he, himself, ran a hatchery at Sleepy Eye in 1925, but was not running it in 1924. States that he had been running his hatchery ever since he begun in 1925, but this last hatching season he only operated one machine. Says he controls this one hatchery with its one incubator, and was running this at the same time Snow was running his hatchery, as a competitor of Mr. Snow from 1925 on to 1927. He states that he was also a competitor of Mr. Snow's in selling chickens.

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606 JOSEPH I. TAGGART'S Testimony. (In rebuttal)

His testimony, under direct examination, runs from pages 663 to the top of page 681, inclusive, and his testimony, under cross-examination, runs from near the top of page 681 to the middle of page 691 of the typewritten trial record and all of his above identified testimony is here reproduced in full.

607 Joseph I. Taggart, recalled as a witness for and on behalf of the plaintiff, testified as follows:

Direct Examination.

By Mr. Ely:

Q. Mr. Taggart, have you ever measured the volume of air coming over the beams in a Smith incubator when the curtains are drawn back and out of the way?

A. Yes.

Q. How have you measured it?

A. I have measured it with anemometers.

Q. How do you get the volume, then?

A. You place,—a three inch anemometer will fit between the beams and the roof of the incubator; it will just go in there, and by placing the anemometer there a very few inches along through that space you can take the readings and then by multiplying that by the cross-sections, you can take the average reading; multiplying that by the cross-section you can get the volume of cubic feet per minute within approximate limits.

Q. How does the volume of air passing over the beams, when the curtains are withdrawn, compare with the volume of air which passes over those same beams when the curtain is in place?

A. When the curtain is withdrawn the volume going over the beams is slightly increased, if there is any difference; sometimes it does not show any difference; other times it shows a slight increase.

608 Q. Do you know why it should show a slight increase? Have you any idea upon that subject?

A. The curtains might offer some resistance to the flow of the air, and when the curtains are drawn back, it might be a little bit easier for the air to get out from in front of the fans and it would naturally draw in a little bit more if the exit was freer.

Mr. Williamson: This is supposed to be rebuttal. There has not yet been anything shown to indicate what it rebuts.

The Court: I think I know what it rebuts. It tends to rebut the testimony of Professor Rowley in reference to the flow of the air up, over and back into the fan.

Mr. Williamson: All right, if that is the intent of it.

Q. You heard Mr. Rowley testify today that the trays in the Smith, when he made this test, with the curtain removed, on Sunday, when he said the trays were in the same position as they were when we were down at Third Street. Do you recall hearing that testimony?

Mr. Williamson: Call it the Flour Exchange Building.

Q. At the Flour Exchange Building? A. Yes, sir.

Q. How were the trays in the Smith incubator when the tests were made at the Flour Exchange Building last week on Monday, when we were present?

609 A. All the time,—every time I have been there,—that is, when the Court was there and when we were making our demonstration, or during their demonstration, the trays were hanging as near horizontally, as they were able, —one side dropped down just slightly,—they were not turned so as to make free air passageways up between the trays,—between the tray columns.

Q. Would that affect the free passage of the air up, if a test were made?

A. It would.

Q. In what way would it affect it?

A. When the trays are not turned at the regular operating angle, the space between the trays is only about five-eighths of an inch, so that air column between the column of trays is practically closed off.

Q. Now, I gathered from Mr. Rowley's testimony that your drawings might be artistic, but they were not accurate. He criticised your drawings. Have you any answer which you wish to make with respect to those criticisms?

Mr. Williamson: That is a pretty general question.

The Witness: Yes, sir, I would like to answer it briefly.

Q. Will you do so briefly?

The Court: Well, it is the short way of doing it.

The Witness: I would like to first to refer to Exhibit 7, which shows a cross-section of the Smith incubator. In Professor Rowley's test, which he made in my pres-

610 ence, he tested the speed of the air as it came from the fan, and also the speed of the air as it passed under the hatching trays. Those tests, which he made in my presence, checked almost exactly with the information recorded here. When the fans are rotated,—

Q. Pardon me, what incubator are you talking about now?

A. With the Smith incubator, which was tested at the Flour Exchange.

Q. All right.

A. He made certain tests there of fan speeds, the volume of the air coming from the fan and the speed of the air coming from the fan and also the speed of the air going underneath the hatching trays. Those tests check almost exact-

ly with the information as I have it recorded here. A fan of this type, when it rotates, throws a cone-shaped current. The speed of the air delivered from the tip of the fan is a great deal faster than the speed of the air near the center of the fan. In other words, the fastest speed might be called funnel-shaped. Where this outer speed or outer moving air that passes and strikes the curtain, and turns down, the speed there is comparatively stronger than it is near the center of the corridor, and if one stands in the center of the corridor and takes an anemometer reading in the position, in the location where he referred to, where the speed is recorded here as five hundred feet per minute, and six hundred feet, you are getting readings very comparable to that.

611 Now, in regard to the air currents back of the curtains, I have been making tests at different times for several years, six or seven or eight years, on this very point, and I have used different methods. At one time, I made slits in the curtain near the height of the eye, that I could look through, and at other times I have taken two curtains and placed them together on the curtain rod, and as I wanted to move from one part of the machine to the other, I could move the two curtains along and look through the crack where I could separate the two curtains. When I was preparing for the exhibit, which we have on Thirteenth Street Northeast,—

Mr. Williamson: Minneapolis?

The Witness: Minneapolis,—I had a standard size sheet of celluloid, that was twenty by fifty inches sewed into a curtain. The speed of the air up through the trays, and in the air columns, between the trays, as recorded here, is the record shown by the three inch Biram anemometers of the type which I showed at the demonstration over here. Those anemometers are greatly affected by friction at the lower speeds. They still show direction, but it is necessary to have a big correction to take care of the low speeds. The manufacturers give you a correction chart for speeds from two hundred feet to a thousand feet. Below two hundred, the friction is of such consequence that they do not give you a correction chart for those speeds. In making
612 up these charts here, that is the speed that was recorded by those anemometers, and I have already stated on direct testimony that in the making of all of these charts, I did not make the corrections for friction. I gave the readings as given by the anemometers. I might say that this type of an anemometer is considered very accurate

at five hundred feet per minute. At higher speeds, we have to subtract, and the amount varies from zero up to forty feet per minute. As you decrease the speed below five hundred feet per minute, you have to add to, that is, the friction slows the instrument down, and the readings, as I have recorded them here, are accurate as recorded by the anemometers themselves. Now, I would like to refer to Exhibit E-12, which shows on the first a cross section of a Snow incubator that was built by us, and one that we tested over at the warehouse where we have our tests before the Court.

Mr. Williamson: There were no tests made at that time. I object to that statement, of any tests having been made at that time. The machines were simply shown to the Court without any tests.

The Witness: Very well. The machine was shown to the Court.

Mr. Williamson: That is all right. You mean the plaintiff's model of the Snow machine, do you?

The Witness: Yes, sir.

Mr. Williamson: We never saw any tests made.

613 Q. Go ahead.

A. In this Exhibit 12 there are several sheets, I think eleven in number,—they were entered as an exhibit at one time.

The Court: I suppose this should be rebuttal. Is this rebuttal?

Mr. Ely: It is simply put in to answer those criticisms of the drawings, but make it very brief.

Q. There was something said about arrows here.

A. On 12 AA, which shows the fans at the back of the trays, it was stated that it was impossible for me to get these readings and particular attention was called to the reading of 1350 feet per minute directly below the fan to the left,—that is, behind the hatching rack and within four or five inches of the floor. In the first place, there were paper ribbons put there to show the direction of the air at the floor. The fans were then stopped and an anemometer was put at right angles to the direction of the flow of the air, as shown by the paper ribbons, and the trays were returned to their regular place, and the fans started, and I then crawled in on top of the hatching racks, in front of the opposite fan so

I would not in any way interfere with the operation of the left hand fan. From that position, I could see the anemometer by means of a light, and could take its reading in lineal feet per minute. Now, in making all of these tests
614 on the rear wall, I first experimented and I found that the air in front of the fans covered by the area of the circumference of the fans was moving into the fan. I know from experience that when I stand behind the fan I do not materially interfere with the direction or quantity of the air that is being discharged from the fan. The records here show only the discharge from the fans. Now, after this record was compiled, I then worked on the air flow at other parts of the machine. Whenever I was working with the out-going air, I made it a point to not get in front or get into the flow of that out-going air.

When I was working with the in-going air, I kept out of the in-going air so as not to break up the flow of the air currents.

Q. Professor Rowley criticised you severely in regard to the use of arrows. What have you got to say as to your use of arrows?

A. An air current is invisible. They can only be shown diagrammatic. I know of no other way of showing them except by arrows. I have attended sessions of engineers that were dealing with air currents, and they illustrated them by arrows.

The Court: I do not believe Professor Rowley intended to criticise you for using them, but what he was criticising you for was that you were using the arrows to indicate something that he did not think you were able to ascertain.

615 The Witness: These twelve sheets,—there may be more than twelve,—these eleven sheets are all a part of the same exhibit. I know of no way,—

The Court: You better identify them.

The Witness: Exhibit 12. They are all diagrammatic. You cannot show a diagonal arrow as going diagonally through the plane on which your exhibit or drawing is made. When they are checked with each other you will find that they check very closely. They were made over a period of perhaps two months; one plane was completed weeks before other planes were started, and it is nothing more than natural that there would be slight errors at different points.

When I was making the horizontal planes, that is, EE, FF, GG, HH, and JJ, the trays were turned at an angle of approximately 90 degrees from the position in which they were the first time and we must have some apparent discrepancies. Now, I want to call particular attention to 12-FF, the arrows, as shown in here, are intended to represent the air current as near in that plane as possible. The trays were turned to an angle of 45 degrees from the horizontal, and anemometer readings are shown on the floor of the trays wherever the air current is cutting into the trays; that is, if we had it up at a 45 degree angle and the anemometer there has a plus reading, it means the air is going down towards the floor, but the anemometer was in an angle 45 degrees from it,—in other words, the air currents were coming out and cutting directly into the tray, and with
616 that explanation, there is no reason apparent to me for criticism of the particular point he brought out.

Q. Now, taking your direction of flow, as shown in your planes or horizontal section, is that subject to revision, to the vertical section in which some diagonal arrows are shown? A. Certainly.

Q. That is, you have to record the drawings in the horizontal and the vertical planes together in order to get the right direction, is that right?

A. Certainly. The entire exhibit is submitted as one exhibit and the different planes should be taken into consideration when making any interpretation of them.

Q. In an examination and study of a machine of this type, with an anemometer, how does that compare with using smoke and visual observation, in getting at the right and the true state of affairs?

A. In my studies I have used smoke, paper ribbons and the anemometer. You cannot determine speed by smoke. The anemometer is the best method of determining speed; that is, it is the best of those three and it is the only practical method for a problem of this kind. You can get direction more quickly with smoke and with paper ribbons, where you have conditions so that the paper ribbons will not foul or become entangled.

Q. How do your findings of a current movement of air in the Snow incubator compare, briefly, in a general
617 way, with such findings as Professor Rowley has made with smoke and a few anemometer tests?

A. Wherever he made anemometer tests, they check very closely with mine. His smoke test for directions check very closely with the conclusion that I had arrived at from check-

ing in the machines which we built. The area in which the air is flowing into the fan is practically the same; there might be a slight difference caused by the speed of the fan or the size of the fan, or the little difference in the outer wall, but, the air is flowing from the corridor to the fan over practically the same area, and it is flowing out from the fan over practically the same area,—the large portion of it going to the corridor where there is a general mixing and then is drawn back over the egg trays to the fans.

Q. Is there any way you want to make that clear or anything you want to use to make that last statement clear?

Mr. Williamson: Don't ask the witness to give us a lecture.

The Court: That is what you have been doing right along, both experts.

The Witness: I would like to use the model which shows the celluloid planes. I want to just compare that with the results that we have found at the Flour Exchange.

Q. Is this what you want?

The Court: Is this repetition?

Mr. Williamson: What is this rebutting?

618 Mr. Ely: You said Mr. Taggart's were entirely different from those of Mr. Rowley.

Mr. Williamson: I did not say entirely different.

The Court: Go ahead.

The Witness: At the Flour Exchange we made smoke tests.

Mr. Williamson: That is, we made them, the defendant made them?

The Witness: The defendant made smoke tests in the center line of the trays. There they endeavored to release the smoke at the center line of the tray 18 inches from the corridor,—the smoke could be plainly seen going clear to the back of the trays, where the reading "I" for "in" is shown, it means that for a space of 15 or 18 inches it was going straight in or straight in with just slight turbulence,— all air moving at this speed is turbulent, and especially if it comes in contact with any object. When we colored Exhibit 23 and 24,—

Mr. Williamson: Plaintiff's Exhibit.

A. It not only represented the conditions at the center of the tray, but, also represented particularly the conditions at the back of the trays. In other words, we had a space there 18 inches thick. Now, at the Flour Exchange they did not take smoke tests near the front of the trays, that is, within the trays. They were all taken in the corridor, that is, say, an inch in front of the trays. In making this
619 plane which I have made three inches from the front of the trays, I did not find near the disturbance that they found with smoke here where they work in the corridor, —if you will note back into the trays just a little bit you will find a definite movement just the same as we found near the center of the trays; in other words, if we had a plane here in which the air is moving into the fans and 18 inches in front of that we have another plane where we know the air is moving into the fan,—maybe it is not directly into it, but it is all over that area, and then another plane near the front of the trays, where it is still moving in, and those planes correspond, it is certainly reasonable to believe that that entire body of air is moving in towards the fan. That is what the smoke test shows in the test that I made. They did not make them down here at the Flour Exchange, but, when I made them, I found that was the case, and I find that the colorings on these sheets correspond remarkably close to what I made,—there is just one thing I want to call your attention to,—on the bottom of these sheets, which are exhibits 23 and 22, there is no attempt made to show the direction of air flow in the hatching trays; there were no tests made in the hatching trays, and, consequently, I did not color the hatching trays. If they were colored, the resemblance between these sheets and the ones that we introduced, they would be closer than they are now.

Q. Now, you heard the exposition of the prior art by Professor Rowley. Briefly stating, and taking the
620 prior art in a sort of a birds eye view, if you can, will you state any advantages that come from the Smith invention, that are not present in the prior art?

Mr. Williamson: I object to the use of the word "invention". If he says "disclosure in the Smith patent," I do not object to it.

Mr. Ely: I will modify it that way.

Mr. Williamson: Disclosure of the Smith patent.

Mr. Ely: Yes.

The Witness: In the Smith method eggs were successfully tiered one upon the other. Take the Smith machine as

an illustration, there we have fourteen trays high. The eggs are packed closely together. In the old style incubator, if you had only one tray high, you would have to have from 25 to 30 times as much floor space for your incubators. It would require much greater housing room. It requires a more carefully constructed room. There is a labor saving in the Smith method over the old prior art method of less than half as much labor. The expense of heating and operating the machine such as the Smith, is, at least, one-fifth of the methods in the prior art. In the Smith method you have one control and one thermostat or one thermometer to read, whereas in the prior art you would have a thermostat and a thermometer for every two to three hundred eggs. The volume of heat that is generated by the eggs and the advantage that is taken of that makes it possible to produce better chicks, because your heat can
621 be held more regular and more uniform. From an economical standpoint, then, there is a very decided saving in the Smith method.

Q. What about the temperature during the period of incubation?

Mr. Williamson: I object to anything further on that. It is not rebuttal. He went into all of this in his direct examination, and I cannot see how it rebuts anything. He is asking him to repeat what he said on direct examination.

The Court: I suppose that is true, excepting this, that you introduced certain exhibits here in the prior art, and he is trying to show here the difference between the prior art that you introduced and his method.

Mr. Williamson: But, he does not call attention to any of the patents or publications, and he assumed that in the prior art they had incubators with single trays, which point I exploded when I cross-examined him when he was on the stand first.

The Court: He is assuming a condition that I will have to pass on in the end whether the prior art shows incubators with tiers of trays like this, or that. That is a matter on which I should receive testimony, and it is a matter which I will not decide now.

Mr. Williamson: But, if he assumes as a part of his answer that in the prior art it only shows an incubator with single trays, he is going right in the face of facts as shown by these prior patents and publications.

622 The Court: Well, that is a matter I will have to pass on later.

Mr. Williamson: It is so obvious.

Q. What about the patents of the prior art that had more than one tray? Will you point out wherein the Smith differentiated from those?

A. I would like to discuss this first.

The Court: Well, go ahead in your own way.

The Witness: By patents we show staged incubation. Each of those that show staged incubation were not workable by experience, and according to the experience I have had. For example, take the Zimmer patent, it is impossible to keep the eggs in the advanced stages of incubation from overheating. A box which I used and placed a dozen eggs in showed that when air could not get to those eggs, we had a considerable amount of heat generated and within thirty minutes time the heat would rise to a point where it would be very injurious to the eggs. In the Stulik patent, the hotter eggs were at the top,—the convection currents would rise from the heating apparatus that would have to be at least 100 or at least 99, and generally 100, to keep the eggs in the earlier stages warm, and that air would continue to rise, and could not possibly cool off the eggs in the more advanced stages which were up at the top where convection currents would carry the heat. Furthermore, I have seen people try to operate machines on that principle, and they have been rank failures in every case. Now, with re-

623 gard to Ure's Dictionary publication, the difference in the temperature of the air between the ceiling and the floor would make that inoperative. If we have any ordinary room that is six or eight feet high, there is, at least, a half a degree per foot difference in temperature between the floor and the ceiling. The eggs in this were arranged at different levels, and there is nothing said about moving the eggs, and, furthermore, they are subjected to the same heating coils, that is, there is the heating coils passing over the top of them, and then you have the convection currents in the room, and if that room is six feet high, and it would lead you to believe that it was, you would expect at least three degrees difference in the temperature betwen the top and the bottom. Now, if you were going to hatch eggs so that the chickens are any good, you have got to keep your temperature much closer than that. I do not doubt but what the operators would get a few chicks, but it certainly would not be commercially operative in that day, and it is

not today. I have seen people try it, and it doesn't work out. Now, wasn't there one more?

Q. The Winkler.

A. The Winkler Patent describes staged incubation. There again there was no forced draft or means for keeping a uniform temperature through the machine, and from my own experience I would say it is impossible to keep that uniform temperature enough to hatch eggs. If that is treated as a whole, and if the whole room is open, you have a much higher temperature at the top due to convection cur-
624 rents, and if it is treated as three separate compartments, there is no arrangement made there for taking care of heat in the latter stages unless it would be they were entirely separate compartments; that is, they have the same heating system, and the water flows from one to the other.

Q. What about any patent that shows more than one layer or tray of eggs,—

Mr. Williamson: I think the patent should be identified.

Mr. Ely: I think he can discuss that whole subject in a general way.

The Court: You may answer it.

The Witness: When you place more than one layer of eggs in a machine, it is not possible without forced draft to have a uniform temperature at both layers. I have seen several people try this, and while they get a few chicks now and then, it is not practical. I have made a diligent search of hatcheries over the entire United States; that is, I have been in every state two or three times, and most states oftener than that, and I have failed to find any machines that were being operated with commercial success or with anything like success, that had over one layer of eggs in the compartment, unless there was forced draft applied to those.

Q. There is something that I noticed written up in the record that apparently is a mistake. When Mr. Perkins was on the stand I asked him about royalties. Who
625 gets the royalties from the Buckeye Incubator Company?

Mr. Williamson: That is not rebuttal.

Mr. Ely: I want to clear up a mistake in the record.

The Court: Very well.

A. Dr. Smith personally.

Mr. Ely: That is all.

Cross-Examination.

By Mr. Williamson:

Q. Mr. Taggart, when did you make the tests which you have tabulated on your sheets that have been introduced here? I mean your test of the plaintiff's model of the Snow machine.

A. The plaintiff's model was built a year ago this winter, sometime during the winter, and some tests were made then, and then the more complete tests were made starting in in August or September of this year, and running up to about the time we shipped the incubator out there.

Q. When did you ship it here?

A. It arrived in town two weeks ago last Sunday or Saturday.

Q. When did you make the particular sheet of the tabulated data relating to that Snow machine, which you placed in evidence here?

A. They are not dated, but they are an accumulation of work at odd times ranging perhaps from September 1st up to November 1st.

Q. Of this year, you mean?

A. Yes.

626 Q. Do you mean the originals were made then?

A. Yes, sir.

Q. Had you used those same originals in any other suit?

A. No, sir.

Q. You have stated you were assistant general manager of the Smith Incubator Company, have you not?

A. Yes, sir.

Q. Did you hear Mr. Samuel B. Smith's testimony given in the Boling case about your relations and your duties in the Smith Incubator Company?

A. Given in the Boling case?

Q. Yes.

A. I don't think the Doctor testified in the Boling case.

Q. He did.

A. It might have been taken on depositions. I wasn't present then.

Q. Isn't it a fact that you have been engaged in all of these infringement suits on behalf of that company, or most of them? A. Not all of them.

Q. You have in most of them, have you not?

A. I will say so.

627 Q. And you would start a suit without consultation with Mr. Samuel B. Smith or stop it without consultation with Mr. Samuel B. Smith, would you not?

Mr. Ely: Objected to as incompetent, irrelevant and immaterial, Your Honor.

The Court: Sustained.

Mr. Williamson: Sustained? I wanted to show his close relationship.

Q. Why did you not make tests of your plaintiff's model of the Snow machine and invite the defendant and his counsel to see those tests?

Mr. Ely: Oh, I object to that.

A. Well, the tests covered a matter of sixty to ninety days at various times. It hasn't been customary in the past. I don't know as—it hasn't been our custom.

Q. After this machine got here why didn't you make tests of that machine and invite the defendant and his counsel to be present?

Mr. Ely: I object to that, your Honor.

Mr. Williamson: That is very important.

The Court: He can answer.

Mr. Williamson: I have got a right to have that answer.

Q. Why didn't you do it?

A. That has not been our custom. It is not the practice of the attorney in charge of the matters. We prepared
628 our data. We brought our data here. We brought the machine here. I have testified to making the tests and I have had the Court there to show him how the tests were made.

The Court: In other words, that was the way you wanted to do it?

The Witness: Yes, sir.

Q. In other words, they preferred to rely on ex-parte than any tests that they showed to us?

The Court: You can argue the credibility of the witness in your argument.

Mr. Williamson: That is right. That is what I wanted to bring out about that.

Q. You stated that you built the plaintiff's model of the Snow machine that is here in Minneapolis and in evidence on behalf of the plaintiff about a year ago, is that right?

A. We started in about that time. I am not sure just when it was built, during the winter a year ago.

Q. A year ago. But on your direct examination you testified that you had built that machine from measurement of Mr. Snow's machine at Sleepy Eye in the basement of the building which was only exhibited to you late last fall.

A. Was exhibited to us on the 29th day of September, 1931. This model was not started for perhaps sixty days after that.

Q. It wasn't a year ago then?

A. Well, it was almost.

Q. Now, on your direct examination, since you have
629 been last on the stand here you made some reference to the incubator, the Bonnemain incubator, described in Ure's Dictionary of Arts, Manufactures and Mines, a photostat of which is in evidence on behalf of the defendant, and you were asked some question about the trays being super imposed and if I recall your testimony correctly which has not yet been transcribed, you said here today that you saw that machine tested. You mean to say that you saw the actual Bonnemain incubator tested anywhere in the world?

A. No, I have seen machines tried out along that same principle.

Q. You mean with super imposed trays?

A. Yes, sir, but they did not work.

Q. But you don't pretend ever to have seen the so-called Bonnemain incubator described in that publication, do you?

A. I stated that I had seen incubators that were built, tried out along that same principle.

Q. But not of that exact construction, have you?

A. No, there isn't enough detail given in the description to tell you about it.

Q. Where did you see anything like it and when?

A. Well, at Metheun, Massachusetts, there was one tried out there very similar to it. At Canby, Oregon, there was one tried out very similar to that.

Q. Give the name of it and describe it.

A. I can't remember the man's name at Matheun,
630 Massachusetts, but at this place he had super imposed trays where the eggs were placed on shelves with heating pipes over the top of them. It was in one large room, that particular room was perhaps ten feet long and eight feet wide and trays only on one side. That was perhaps in 1924 or perhaps 1925. I can't give you the exact date.

Q. And it was steam heated coils instead of water heated coils, wasn't it?

A. No, those were hot water coils. You can't use steam when you have the pipes close to the eggs, because to have steam heat your heat must be 212 and in hot water pipes they use a much lower temperature.

Q. And the circulating pipes, were they disposed like in the Bonnemain patent so they run between the different trays? A. Yes, sir.

Q. Was there any thermostat to control the heat in that machine?

A. Yes, they had thermostats on the outlet and these also operated a damper on the stove.

Q. And did they have staged incubation?

A. Yes, they tried it both ways, both with staged incubation and otherwise.

Q. I think you said something about having seen some tests made with some machine something like that described in the German patent to Stulik, did you not?

A. We have built such a machine.

631 Q. When and where?

A. In the—at Cleveland back perhaps in 1924, and I have seen a very similar machine to that at Hayward, California. It was built in the rear end of a garage there. I can't remember the—

Q. When did you see that?

A. I can't remember the man's name, but it was near the Henning and Schroeder hatchery, and that might be in 1925 or 1926.

Q. And was in use hatching eggs?

A. They built it and tried to use it. It wasn't a success.

Q. They did hatch chicks with it, didn't they?

A. Oh, there was some eggs hatched, yes.

Q. In the one that you made at Cleveland, Ohio, was that made by the Smith Incubator Company? A. Yes.

Q. I suppose you made that to be able to criticise the patent, didn't you, if possible?

A. No, we were trying to find out how far you could compact eggs, carry them along without forced draft. We made numerous tests on that.

Q. Did you try any tests of that, reversing the way in which the trays were set so that those in the later stages would be in the hottest place?

A. At the bottom you mean or at the top?

Q. Either way.

632 A. We tried it both ways.

Q. And it was possible to set the trays in that machine in such a way that the eggs in the more advanced stage

of incubation, the heat from the eggs in the more advanced stage of incubation could be utilized on those in the later stages, could it not?

Mr. Ely: I object to that, Your Honor. You are drawing on your imagination.

Mr. Williamson: No, there is no imagination about it.

Mr. Ely: Talking about the Stulik prior art patent.

The Court: He may answer it.

Mr. Ely: I understand he is not talking about the Stulik prior patent. He is talking about something else.

A. In case of Stulik, if you are copying after Stulik, your hottest eggs are at the top, the ones that are giving off the most heat, and if you keep the temperature right for those at the bottom, and there is no forced circulation of air, by the time you have passed the 12th, the 14th day you will find your eggs in the top entirely too warm and it is only a matter of perhaps the 18th day before the eggs die and it is almost impossible to get any chicks that are worth anything. You may get a few hatched early, but that is all.

Q. You have not answered my question at all. You have gone off on a lecture or some other tactics. Read the question to the witness and give me an answer. You haven't answered the question as put to you at all.

(Question read by the reporter.)

633 A. In the first place we were talking about Stulik and the Stulik arrangement. It is not in that arrangement. You then asked if they were reversed. I hadn't gotten to that part of my answer.

Q. There is the question. Please answer it.

A. Now, if the conditions are reversed, it is better, but you still cannot operate successfully, you cannot arrange them in an ordinary room so that you can keep them at the right proportional temperatures so that they hatch.

Q. Well, you say it is better. Then you did hatch eggs with them?

A. Yes, we hatched some eggs with both of them, but it wasn't commercially successful. It was simply an experiment. You can hatch eggs in a little bit of nothing once in a while, but you can't hatch them successfully.

Q. Now, you talked considerable about the Zimmer patent.

The Court: Gentlemen, are you going to be able to finish this afternoon?

Mr. Williamson: I think I will be through cross-examining this witness in just a few minutes.

The Court: I am going to close at 5 o'clock.

Mr. Williamson: But, we can't quit tonight, because we will have to have a chance to put in some surrebuttal.

Mr. Ely: I object to surrebuttal. I don't see any—

The Court: Gentlemen, I will run until 5 o'clock, and
634 then I will adjourn, and you can go ahead after Thursday. We won't hold court tomorrow.

Mr. Williamson: No, certainly not, certainly not.

Q. Now, you gave considerable testimony about the Zimmer patent, 1075747, of October 14, 1913, being one of the patents in evidence on behalf of the defendant, and you put considerable emphasis on the fact that he used what you call feather blankets, I believe is the word you used.

A. Feather mats.

Q. Feather mats between the trays of eggs, on top of the eggs lying on the trays, did you not?

A. Yes, sir.

Q. And isn't it a fact that he makes clear there in the specifications of that patent that those feather mats were intended to take the place of the feathers of the hen, to be similar to the feathers of the hen when setting on the nest?

A. I think he spoke about that.

Q. And if properly disposed and the trays were properly supported, the incubator disclosed in this Zimmer patent would operate in such a way that the heat of the eggs in the more advanced stages of incubation would be utilized to help hatch those in the late stage of incubation, would it not?

Mr. Ely: I object to that as entirely immaterial—

Mr. Williamson: That is just exactly what he states, proposes to do it.

The Court: He may answer.

635 Q. You can answer.

A. Heat that is forming by eggs in the advanced stages of incubation would be carried by convection currents to those that were higher up, but with no more ventilation than is disclosed there, the chicks or the embryos would practically all be killed before they got to the hatching stage.

The Court: Wouldn't the heat also be carried by contact?

The Witness: Yes, sir.

Mr. Williamson: By radiation.

The Court: By radiation, yes.

Mr. Williamson: There is no question about it.

Mr. Williamson: That is all.

(Witness excused.)

Mr. Ely: Plaintiff rests.

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636 Defendants' Surrebuttal Case.

NORA SNOW'S Testimony.

Nora Snow, being recalled and examined as a witness on behalf of defendants in rebuttal, testified as follows on pages 693 to 709 of the typewritten trial record and the same is here reproduced in full.

637 November 25, 1932,
At 10 o'clock a. m.

Hearing resumed pursuant to adjournment.

Court and counsel present.

Mr. Williamson: May it please Your Honor, we have one witness that we desire to examine in surrebutal, Mrs. Snow.

Surrebuttal.

Nora Snow, recalled, testified as follows:

Direct Examination.

By Mr. Williamson:

Q. Mrs. Snow, did you hear examined, on behalf of the plaintiff, the woman who now lives in Mankato, but who formerly lived at Sleepy Eye, by the name of Lena Leux?

A. Yes, sir.

Q. How long have you known her,—just a minute, I will withdraw that question. Just state, Mrs. Snow, briefly, what have been your relations to the business of your husband, Mr. E. H. Snow,—I mean, in the conduct of his business; answer it briefly.

A. Well, I have always had a housekeeper and therefore I was with him almost continuously.

Q. You say you have a housekeeper?

A. Yes, and so my time was spent mostly with him.

Q. And what were your own duties in the business?
638 A. I took charge of the books and advertising, and whatever went on in the office.
Q. And did you have charge of the hiring and firing of all the help? A. Yes, sir.
Q. Now, you said you heard this Miss Lena Leux examined; did she have charge of the books at all?
A. No, sir; that is, she had charge of booking the orders, chick orders.
Q. On page 618 of the transcript, or of the record, she says that she did the bookkeeping; is that true or false?
A. That is false.
Q. On page 619 of the record, she stated that there was nobody else in the office besides herself; is that true or false?
A. That is not true.
Q. What is that? A. That is not true.
Q. Was there an egg setting book kept in the conduct of the business,—an egg setting book? A. Yes, sir.
Q. Who kept that?
A. Well, there were different ones.
Q. Well, did this woman keep it, Lena Leux?
A. Not entirely, no, sir.
Q. On page 626 of the transcript, she says that pre-
639 cautions were taken to conceal the operations going on in the cellar of Mr. Snow's plant there in Sleepy Eye; is that true or false?
A. (Witness hesitating) Well, we did not allow everybody to go down there; it was Mr. Snow's experimental place; it was not kept under lock and key.
Q. It was not kept under lock and key? A. No, sir.
Q. Was it ever kept under lock and key? A. No, sir.
Q. On page 632 of the transcript, she said that she had something to do with the advertising while she was there employed; is that right? A. Yes, sir.
Q. She also said in answer to cross-question that she did not mix up the advertising; is that true or false?
A. It was false.
Q. What are the facts about that matter,—what are the true facts about that matter?
A. Did you want me to explain it?
Q. Yes, in brief; did she mix them up?
A. Well, we had discharged her, and at that time she had asked for a recommendation, which Mr. Snow gave to her, but we re-hired her, and put her back into the advertising. At this time I used to check over the advertising, and I found out that some of the ads had been going out without
640 price sheets, which made this advertising practically unvaluable. I began checking up, and as I came to the

table where Miss Leux was with three other girls, one of the girls, being very conscientious, broke down and said that she knew who the party was that made this mistake.

Mr. Ely: I object to that as hearsay.

Mr. Williamson: (interrupting) I object to counsel interrupting there.

The Court: Just a minute. Counsel is making an objection as to a statement made by the witness, and he may make his objection.

Mr. Ely: I will object to that testimony as hearsay, Your Honor.

The Court: The objection is sustained.

Mr. Williamson: As to what point in her answer?

The Court: She is now saying that some person in the employ of the concern made a certain statement to her, and that may be stricken out.

Mr. Williamson: All right. Just confine yourself to what you yourself know, and don't say anything about what anybody said.

Q. Go ahead, if you were not through.
A. Well, I realized, through this, that it was impossible to keep her in our organization; therefore, we discharged her for the second time, as we could not trust her.
Q. And so you discharged her?
641 A. We discharged her for the second time.
Q. And was any recommendation ever given to her after that second discharge?
A. Not the second time, no, sir.
Q. What is that? A. No, sir.
Q. Now, on page 633 of the transcript, this woman, Lena Leux, testified to the effect, and finally admitted that she had been put out, but she said the reason was that Mr. Snow wanted to put in some of his relatives. Is that true or false?
A. It is false.
Q. Did Mr. Snow have any relatives that he sought to put in there? A. No, sir.

Mr. Ely: I object to that question.

By Mr. Williamson:
Q. Did he put any relatives in there? A. No, sir.
Q. And, on the same page, 633, she said that she had no trouble; is that true or false? A. That is false.

Q. On page 634, she testified to the effect that you were not there very much of the time while she was employed there; is that true or false? A. That is false.

Q. Were you there most of the time?

A. We would be gone, perhaps, for a half a day, or a
642 day, at a time, when we would go to check up the other hatcheries, but at these times I would work late at night, in charge of the books.

Q. There is another place, on page 634, or 635, where she said that you were not in charge of the books and records; I think that was the substance of what she said; is that true or false? A. That is false.

Mr. Ely: Just a minute, on what page is that?

Mr. Williamson: On page 634 or 635,—well, I will withdraw that question; I suppose it is too broad.

By Mr. Williamson:

Q. You testified as to the only records that she had anything to do with, have you not,—you have already named the only records that this woman had anything to do with?

A. Yes, sir.

Q. And that was the order book, was it?

A. Yes, sir.

Q. And those were kept under your direction, weren't they? A. Yes, sir.

Q. On page 636, she said that millions of eggs were hatched there at that hatchery, while she was employed there, every year; is that true or false? A. Was it eggs?

Q. She said millions of eggs.

A. Was it eggs or chicks?

643 Q. It was chicks; I beg your pardon; I meant, chicks, of course. Will you substitute the word "chicks" in there? A. No, sir.

Q. Was that false? A. That was false.

Q. Did you keep any record of the chicks which you did hatch? A. No, sir.

Q. Is it a fact that Mr. Snow had other hatcheries in different parts of the state at that time? A. Yes, sir.

Q. And is it also a fact that the chicks hatched at these other hatcheries were brought to Sleepy Eye and shipped from there? A. Yes, sir.

Mr. Ely: I object to this examination. Mr. Snow is present here in the court room. I don't know why his wife should take the stand on that matter.

Mr. Williamson: I think that that is a perfectly proper question. This woman said there were millions of chicks there. Now, she could not tell whether they were chicks hatched from that hatchery, or from a hatchery at some other point.

Mr. Ely: I am objecting to her testimony because Mr. Snow is in the court room, and his wife is incompetent to testify, while he is in the court room.

The Court: I don't think it is incompetent because
644 he is in the court room.

Mr. Ely: I think Mr. Snow ought to be examined on this point.

The Court: Well, of course, that is relative; the objection is overruled.

Mr. Ely: Exception.

The Court: You can answer the question.

A. What was the question?

(Previous question read by the reporter.)

A. Yes.

By Mr. Williamson:

Q. And was that in small or large numbers?

A. Sometimes in large numbers, and sometimes in small numbers.

Q. So that from the number of chicks that were shipped from that place, or from that factory, you could not tell how many had been hatched there, could you,—an observer?

A. No, sir.

Q. Did this woman, Lena Leux,—I will withdraw that question. Just state again, briefly, what was the only duties, or what were the duties of this woman, Lena Leux, at that time.

A. Well, they were booking the orders, and whenever there was nobody else in the room, she had charge of the customers coming in.

Q. And on what floor of the building was that?

A. That was on the main floor.

645 Q. On the street floor? A. On the street floor.

Q. And is that where the office was? A. Yes, sir.

Q. And her position, and place of doing her work was in the office, was it? A. Yes, sir.

Q. Did she have any occasion, or did she have any duties which called her to visit the cellar, in the basement of the building? A. No, sir.

Q. None whatever? A. None whatever.
Q. Did this woman, Lena Leux, have anything whatever to do with the hatching of such eggs as were hatched at that hatchery at that time?
A. Nowhere, no, sir; she would only write out the egg checks.
Q. (continuing)—except, of course, as to keeping the orders? A. Yes.
Q. That is all that she did?
A. Yes, sir.
Q. Did you ever see her downstairs,—I mean, in the basement of that building? A. No, sir.

Mr. Ely: I object to that question.

646 Mr. Williamson: That is all.

Cross-Examination.

By Mr. Ely:
Q. After you left here Wednesday night, didn't you and Mr. Snow, and a Mr. Williamson of the Williamson firm, drive to Sleepy Eye?

Mr. Williamson: I did not go to Sleepy Eye.

A. No, sir.
Q. Well, the younger Mr. Williamson, one of Mr. Williamson's sons? A. No, sir.

By Mr. Ely:
Q. Did you and Mr. Snow go to Sleepy Eye?
A. Wednesday night?
Q. Yes. A. The night before Thanksgiving?
Q. Yes. A. Yes, sir.
Q. And didn't you have a meeting up in the hatchery Wednesday night? A. The family.
Q. No; pardon me; didn't you have a meeting Wednesday night?

Mr. Williamson: She said, the family.

By Mr. Ely:
Q. Did you have a meeting in the hatchery Wednesday night at Sleepy Eye? A. Not to my knowledge.
Q. Not to your knowledge?
647 A. No, sir.

The Court: A meeting of whom?

Mr. Ely: All right.

By Mr. Ely:
Q. Were you and Mr. Snow in the hatchery Wednesday night?
A. Well, we live above the hatchery; we are upstairs and downstairs.
Q. Weren't you in the office of the hatchery Wednesday night? A. I would think so.
Q. Who else was there?

Mr. Williamson: That is objected to as immaterial, if Your Honor please.

A. Well, our help, I imagine.

The Court: Well, I cannot tell whether it is or not.

A. Our help.

By Mr. Ely:
Q. Can you name them? A. Yes.
Q. Name them, please; who was there Wednesday night?
A. Well, Mr. Woods.
Q. Where is he from? A. He is from Mankato.
Q. Who else? A. A nephew of mine, who stays with us.
Q. And who else?

By Mr. Williamson:
Q. He lives with you?
A. He lives with us.

648 By Mr. Ely:
Q. And who else? A. Mr. Snow.
Q. Anyone else? A. Myself.
Q. Anyone else? A. Perhaps my daughter.
Q. Anyone else? A. Not that I can remember.
Q. On Thanksgiving Day, were you and Mr. Snow in the hatchery?
A. Yes, we were back and forth; we live right upstairs.
Q. Was anybody there besides yourself? A. Yes, sir.
Q. Who? A. Well, at what time?
Q. At any time during Thanksgiving Day.
A. My son-in-law was there in the afternoon.
Q. Was anyone there in the morning? A. No, sir.
Q. There was no other person there in the morning at all?
A. Not that I can recall.
Q. Now, I will ask you, Mrs. Snow, do you know of a paper published in Sleepy Eye by the name of the Sleepy Eye Progressive?

Mr. Williamson: I object to this as not proper cross-examination. I did not ask any questions about any paper from Sleepy Eye.

649 The Court: I don't know where it is leading to.

Mr. Williamson: That is objected to as immaterial and incompetent.

The Court: It must be preliminary; I don't know what it is leading to. The objection is overruled. You can find out.

Mr. Williamson: Exception.

By Mr. Ely:

Q. Do you recognize this paper as the Sleepy Eye Progressive of January 7, 1924, and do you recognize that write-up of the Snow incubator in that paper?

(Document submitted to the witness.)

Mr. Williamson: The same objection. We should find out what it is leading to.

The Court: Well, I have not admitted anything as yet; I have not admitted that paper; it has not been offered yet. I cannot find out, except in the course of the examination.

Mr. Williamson: Well, it is not proper cross-examination; I did not ask her anything about that paper.

The Court: Well, it may turn out to be; I cannot tell; I cannot tell without getting you lawyers up here and examining you first. The objection is overruled.

Mr. Williamson: Exception.

A. Well, I don't quite get this. Wasn't it brought out before the Court here, that we bought our Smith machine in 1924?

By Mr. Ely:

Q. I want an answer to my question.

650 Mr. Williamson: I want to see whether the answer is down.

By Mr. Ely:

Q. I wish you would answer the question.

A. What was the question?

(Previous question read by the reporter.)

A. Well, it is a likeness.

By Mr. Williamson:

Q. It is a likeness? A. Yes.

Mr. Williamson: Now, if Your Honor please, it is pretty clear what counsel is driving at.

The Court: Well, I don't know what he is driving at.

Mr. Williamson: Well, I think I do. He is trying to get testimony from this woman, about some other incubator that was there used at some time in that hatchery, and that that is referred to here in this paper; that is what he is asking the witness; I have not asked her any questions about that. It is entirely improper cross-examination.

The Court: Well, this is not before the jury.

Mr. Williamson: But why should not he have put that proof in in his case on the direct?

The Court: Will you just wait a moment? He has not offered any such testimony as that, and when he does so, it will be time enough to object.

Mr. Williamson: Well, he is asking her a question about that.

The Court: No; he is asking her if she recognized
651 that paper.

By Mr. Ely:

Q. Well, do you recognize that article; have you seen it?
A. I would not say positively.

The Court: What is the date of that paper?

Mr. Ely: January 7, 1924, Your Honor.

The Court: Well, go ahead.

Mr. Ely: I will offer the paper in evidence.

Mr. Williamson: Now, we object to that, Your Honor, as incompetent and immaterial to any of the issues in this case, and not proper cross-examination.

The Court: I don't see where it is competent.

Mr. Ely: Well, it is competent, Your Honor, because Mrs. Snow has been brought on the stand to dispute the testimony of Miss Leux. Now, here are some papers which we have,—we have this paper, and we have some other papers,—which show the affairs of Mr. Snow building his own incubator, which is what Miss Leux testified to.

Mr. Williamson: No, no.

The Court: (interrupting) Just a minute, now, gentlemen; I will hear one at a time. If you will sit down, gentlemen,—I don't like this manner of crowding around the Court. When one lawyer gets through, you sit down, and I will listen to the other.

Mr. Ely: Mrs. Snow has been on the stand and disputed the testimony of Miss Leux, as to the operation of the
652 Snow machine,—of certain incubators in the cellar, and that article which you have before you there, is a descripton of the incubator built by Mr. Snow, and they were said to have been operated in the cellar of that establishment, and I therefore offer that paper in evidence.

Mr. Williamson: If Your Honor please,—

The Court: (interrupting) I don't care to hear you. I think it is incompetent. If some reporter was here, and was sworn, and stated his reason for publishing that, the origin of it, and who was the author of it, and where he got his information, that would be different, but there is nothing in here for the Court to consider. The objection is sustained.

Mr. Ely: Exception.

By Mr. Ely:

Q. Do you know, Mrs. Snow, the origin of that article?

Mr. Williamson: The same objection.

A. I do not recollect.

By Mr. Ely:

Q. You don't know, then? A. No, sir.

Q. Do you know whether Mr. Snow gave that to the reporter of that paper? A. I would not remember.

Q. Is that article in that paper a statement of the true state of affairs at the Snow hatchery in 1924?

Mr. Williamson: That is objected to as hearsay.

The Court: Just a moment. We have plenty of time to
653 hear this matter. I don't see, even though the article was genuine, and that that is the date that it was published and authorized, and agreed to by Mr. Snow, that it is applicable here at this time; I don't see it. As I understand it,—I have not read it,—what you are showing is that they had some other incubator.

Mr. Ely: That they had an incubator just as this woman testified,—that they had an incubator in the cellar.

The Court: She has not disputed that.

Mr. Ely: And that they operated an incubator in the cellar there.

The Court: She has not disputed that.

Mr. Ely: All right.

The Court: The objection is sustained.

Mr. Ely: Exception.